PB86-167293

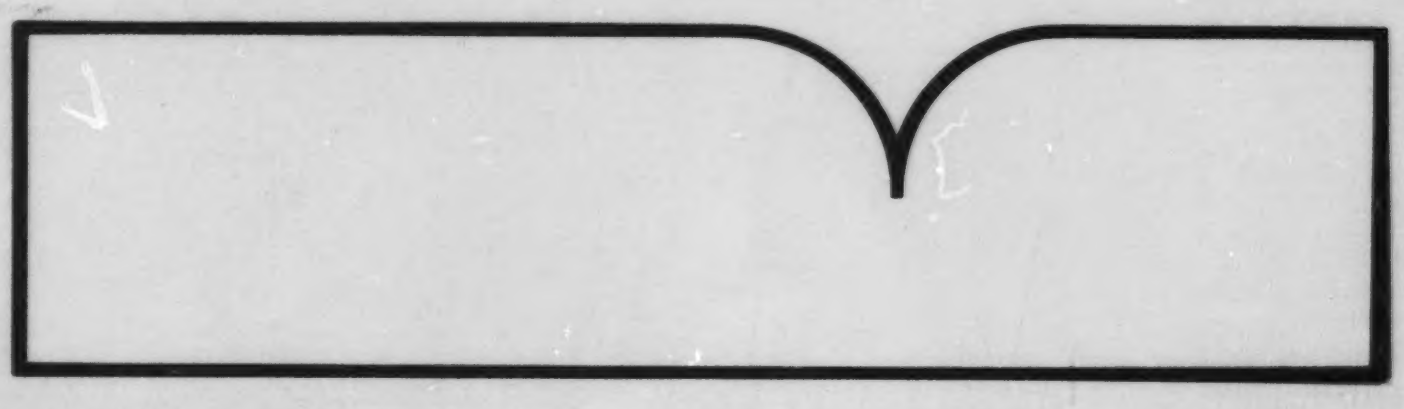
Evaluation of Mobile Source Air Quality Simulation Models

TRC Environmental Consultants, Inc.
East Hartford, CT

Prepared for

Environmental Protection Agency
Research Triangle Park, NC

Feb 86



U.S. Department of Commerce
National Technical Information Service
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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-450/4-86-002		

4. TITLE AND SUBTITLE	5. REPORT DATE
Evaluation of Mobile Source Air Quality Simulation Models	February 1986
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
David Wackter and Paul Bodner	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
TRC Environmental Consultants, Inc. 800 Connecticut Boulevard East Hartford, Connecticut 06108	11. CONTRACT/GRANT NO. 68-02-3886
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
U.S. EPA OAQPS, MDAD, SRAB (MD-14) Research Triangle Park, NC 27711	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report summarizes the result of a comprehensive evaluation of four mobile source air quality simulation models using data collected from five field measurement programs. The report contains numerous tabulations of each model's performance in terms of statistical measures of performance recommended by the American Meteorological Society.

The purpose of the report is two-fold. First, it serves to document for the models considered, and similar models, their relative performance. Second, it provides the basis for a peer scientific review of the models. To stay within the spirit of this latter purpose, the report is limited to a factual presentation of information and performance statistics. No attempt is made to interpret the statistics or to provide direction to the reader, lest reviewers might be biased.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Mobile Source Air Quality Models Carbon Monoxide Statistical Measures Performance Evaluation Mobile Source Data Sets		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
		236
	20. SECURITY CLASS *(This page)*	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/4-86-002
February 1986

Air

PB86-167293

EPA

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SPRINGFIELD, VA. 22161

236

EPA-450/4-86-002

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Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Monitoring and Data Analysis Division
Research Triangle Park, NC 27711

February 1986

This report has been reviewed by the Office Of Air Quality Planning And Standards, U.S. Environmental Protection Agency, and approved for publication as received from the contractor. Approval does not signify that the contents necessarily reflect the views and policies of the Agency, neither does mention of trade names or commercial products constitute endorsement or recommendation for use.

EPA-450/4-86-002

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1.0 INTRODUCTION

EPA is involved in an ongoing study to systematically evaluate the performance of air quality simulation models using statistical measures recommended by the American Meteorological Society (AMS). Results of the study, in conjunction with scientific peer review, will provide EPA with measures of accuracy and the degree of confidence that can be expected when air quality models are applied in regulatory settings. Mobile source models are one category of models to be evaluated.

In this study, the following mobile source models were evaluated:

- CALINE3
- GMLINE
- HIWAY-2
- PAL

Section 2 of this report contains a brief description of these models along with a description of the procedures for implementing and testing the models and the unique input data requirements.

The five data sets used for this evaluation are listed below:

- GM75 - General Motors Sulfate Dispersion Experiment (SF_6)
- SRI75 - SRI, Highway 101 (CO)
- NYS76 - New York State, Long Island Expressway (SF_6)
- NYS77 - New York State, Long Island Expressway (CO)
- CAL74 - California Department of Transportation, Santa Monica Freeway (CO)

These data sets are described in Section 3 along with diagrams showing the locations of monitoring sites relative to the roadways.

The statistical approach is presented in Section 4. Sets of observed and predicted concentration values have been grouped in various ways to depict performance for the high end of the frequency distribution as required for regulatory applications, as well as performance for the full spectrum of observed and predicted values.

In Section 5 the results of the study are presented. Summary tables of the statistical measures recommended by the AMS are presented for each model and data base. Examples of the tables by subsets of meteorological conditions and monitoring station (the full set of which are shown in the appendices) are also presented.

Four sets of appendices provide tables of statistical results for various data groupings. Appendix A contains tables of High "N" results. Appendix B contains the "All Paired" and "High by Event" analyses. The "High by Station" tables are shown in Appendix C and single value comparisons are provided in Appendix D.

2.0 DESCRIPTION OF THE MOBILE MODELS

The four models evaluated in the mobile source category include CALINE3, GMLINE, HIWAY-2, and PAL. As shown in Table 2-1, each model requires similar inputs to determine concentrations. These inputs include descriptions of the highway site, receptor locations and meteorology. While the inputs to each model are similar, different methods are used by each model to simulate dispersion near a roadway. A brief summary of each model follows, along with a description of necessary coding changes made by TRC. The reader is referred to the individual user's guides for a detailed description of each model.

2.1 CALINE3

The CALINE3 model (Benson, 1979) was developed by the California Department of Transportation. It simulates dispersion of highway emissions by dividing individual roadway links into a series of elements from which incremental concentrations are computed using a finite line source equation. The incremental concentrations are summed to obtain a total concentration estimate at a particular receptor location.

CALINE3 simulates the region directly over the roadway as a zone of uniform emissions and turbulence called the "mixing zone." This zone experiences increased dispersion due to mechanical turbulence created by moving vehicles as well as thermal turbulence created by hot vehicle exhaust. CALINE3 adjusts the level of turbulence as a function of wind speed. At low wind speeds residence time of an air parcel within the mixing zone is increased, resulting in turbulence enhancement through the use of a larger initial vertical sigma value.

The CALINE3 model includes options for simulating dispersion from four types of roadways: at grade, elevated filled sections, elevated bridges, and cut or depressed sections. Multiple lanes, links and orientations can be simulated.

TABLE 2-1

COMPARISON OF INPUT DATA REQUIREMENTS FOR THE MOBILE MODELS*

Function/Parameter	CALINE3	GMLINE	HIWAY-2	PAL
SOURCE/SITE				
Number of Links, Lanes	X	X	X	X
Link Coordinates	X	-	X	X
Link Height	X	X	X	X
Width of Highway or Mixing Zone	X	-	X	X
Median Width	-	-	X	X
Traffic Volume	X	-	-	-
Emission Factor	X	-	-	-
Emission Rate	-	X	X	X
Buoyancy Flux	-	X	-	-
Surface Roughness	X	-	-	-
Settling Velocity	X	-	-	-
Deposition Velocity	X	-	-	-
Initial Sigmas (σ_y, σ_z)	-	-	-	X
Point, Area, Special Sources	-	-	-	X
Averaging Time	X	-	-	-
RECEPTORS				
x,y,z Coordinates	X	x,z	X	X
Background Concentration	X	-	-	-
Output Units	ppm (CO)	ppm or $\mu g/m^3$	$\mu g/m^3$, ppm (CO)	g/m^3
METEOROLOGY				
Temperature	-	-	-	X
Wind Speed	X	X	X	X
Wind Direction	X	X	X	X
Stability Class	X	X	X	X
Mixing Height	X	-	X	X
Anemometer Height	-	-	-	X
OPTIONS				
Highway Type	At Grade, Fill, Bridge, Cut	At Grade, (elevated)	At Grade, (elevated), Cut	At Grade, Bridge
Wind Speed	-	-	-	Constant or Height Dependent
Emission Rate	-	-	-	Constant or Hourly Varying
DEVELOPMENT DATA				
(See Section 3.0)	CAL74, GM75	GM75	GM75	None

* X indicates required input data

This version of the model was developed with the use of data from two out of the five field studies used for this evaluation: California Department of Transportation's program at the Santa Monica site (CAL74) and General Motors Research Laboratory's program at the Milford Proving Ground (GM75).

2.2 GMLINE

GMLINE, "A Simple Line Source Model for Dispersion Near Roadways" (Chock, 1977a) was developed by General Motors Research Laboratories to describe dispersion near straight-line, at-grade highways. Multiple parallel or crossing roadway links can be simulated and the model allows for a variable emissions height. Empirical relationships from the GM75 field study are directly incorporated into the GMLINE model. The model was not designed to treat cut-sections.

GMLINE simulates dispersion of vehicle emissions by dividing the roadway into separate, straight-line sources, each with a uniform emission rate. Downwind concentrations at a receptor are calculated for each infinite line source, then summed to obtain a total concentration. The model accounts for plume rise due to heated exhaust and includes a wind speed correction to account for increased turbulence created by traffic wakes.

2.3 HIWAY-2

HIWAY-2 (Petersen, 1980) was developed by EPA to replace the HIWAY model (Zimmerman and Thompson, 1975) for estimating roadway pollutant impacts. The model was designed to determine concentrations at receptors downwind of at-grade roadways and cut sections (outside of the cut only). HIWAY-2 was developed with data from the GM75 field program.

HIWAY-2 simulates dispersion by treating highway emissions as a series of finite line sources, each with a uniform emission rate. Concentrations downwind are calculated by numerically integrating a Gaussian point-source

plume along each line segment. The primary differences between HIWAY-2 and HIWAY are that HIWAY-2 includes a new set of dispersion curves and an aerodynamic drag factor to account for dispersion due to vehicle motion under low wind speed conditions.

2.4 PAL

The PAL model (Petersen, 1978) was developed by EPA to estimate pollutant dispersion from point, area and line sources. It was designed to simulate dispersion from several types of roadway geometries including straight or curved horizontal lines and straight or curved elevated lines with variable emissions along each line segment. Model documentation specifies that treatment of elevated line sources is appropriate for open bridge type road segments but not for elevated filled roadways. Cut or depressed roadway sections are not treated by PAL. None of the data sets employed for this evaluation were used in developing the PAL model.

PAL determines concentrations at a receptor due to a line source by numerically integrating the Gaussian point source equation. Calculations are made for a number of points along the finite line, assuming a linear change in concentration between these points. Subsequent estimates of concentration are made by including additional points along the line. When the difference between succeeding estimates becomes smaller than a prescribed value, the calculations are complete.

2.5 Modifications to the Mobile Models

Each of the mobile models was installed and run on the EPA Univac 1100/82 computer at the National Computer Center. Although no changes were made to the basic algorithms of any model, minor modifications were necessary for the following reasons:

- To enable input of data directly from the archived data sets
- To allow output of predictions to disk files for subsequent statistical analysis
- To accommodate unique features of each data set (such as hourly varying emissions)

The first two I/O related changes were made through the addition of subroutines MESSIN and MESSO. Subroutine MESSIN is called as one of the first executable statements in each model. The function of MESSIN is to convert units and reformat all model input data from EPA's Model Evaluation Support System (MESS) formats (Computer Sciences Corporation, 1983) onto a file formatted to the expectations of the respective model. The model-specific formatting is done in subroutine MODLIN, which is called by MESSIN. MODLIN performs three functions to create records of: 1) fixed model inputs, 2) hourly model inputs (ENTRY MDHRLY), and 3) hourly model outputs (ENTRY MESSO). MESSO is called hourly by each model after concentrations have been calculated. The function of MESSO is to convert units of the predicted concentrations and write them to a MESS formatted file. The observed and predicted concentrations on the MESS files are in units of ppm for CO and ppb for SF_6.

Only the main programs for each model were modified by TRC (i.e., existing subroutines were untouched). All changes were documented in the code as follows to allow the respective model developers an opportunity to review and approve their models before the statistics were generated:

- New comment lines were clearly identified with "TRC" in the comment.
- New executable lines contain "TRC" in columns 73-75 (the non-executable portion of an 80 character Fortran record).
- For previously executable lines in the original GMLINE, a "comment out" character "C" in column 1 was included.

Additional changes made to each model are summarized below.

CALINE3

As described above, all coding changes incorporated into CALINE3 were documented with comments in the source listing. Besides changes in I/O (subroutine calls to MESSIN and MESSO), the CALINE3 model was modified to include hourly varying rather than fixed line source emission rates.

To avoid any influence by mixing height on the results, a value of 9999 meters was used for all runs of the CALINE3 model. (Actually, any mixing height greater than about 1000 meters would produce the same results.) It should also be noted that no ambient background concentrations were included in the model runs. Background levels were removed from observed concentrations prior to statistical analysis (see section 4.1).

GMLINE

Major modifications to the GMLINE model were required in addition to the I/O changes to allow an automated treatment of multiple discrete receptors (either upwind or downwind of the roadway), hourly varying source emissions and variable buoyancy fluxes. To handle these enhancements, several variables were redimensioned and additional loopings were added to the original computer code. As a result, the modified model can now handle up to 10 line sources, 25 discrete receptors, and any number of hourly (or half-hourly) meteorological conditions. Calculations of buoyancy fluxes, lane-center/receptor distances and wind/roadway angle are now performed each hour by the modified GMLINE.

Despite these major modifications, no changes were made to the empirical parameters or mathematical algorithm upon which the original model was based. This was verified by duplication of the example model runs in the GMLINE user's guide.

HIWAY-2

No additional modifications were necessary for the HIWAY-2 model. However, for the CAL74 cut-section data set, the depressed highway was modeled as two separate links, one in each direction of traffic flow. HIWAY-2 requires input of a parameter specifying the "width of the top of the cut" for depressed roadways, but does not provide guidance on how to treat multiple links in a cut-section. After reviewing the original HIWAY-2 code, it was decided that, given the width to depth ratio of the cut, and to properly account for emissions varying by lane, a value of half the cut width for each of the two links would be appropriate for input to the model. This technique causes the cut to be treated by the model as two separate cuts. The use of this technique was reviewed and approved by William B. Petersen, the model developer. To avoid influence by mixing height on the results, a value of 9999 meters was used for all runs of the HIWAY-2 model.

PAL

Changes made to the PAL model include subroutine calls to MESSIN and MESSO for I/O and the inclusion of a new READ statement for hourly varying line source emission rates. Following discussions with the model developer (William B. Petersen), it was decided that the PAL inputs of initial mixing (σ_{y_o} and σ_{z_o}) should be allowed to vary hourly as is done internally in the HIWAY-2 model. Two algorithms, for at-grade and cut sections, define the initial sigmas as a function of wind speed. Rather than rerun the entire input data sequence to the PAL model for each hour of data, the hourly sigmas are calculated in a modified version of subroutine MODLIN and read by PAL with the hourly varying emission rates.

All PAL runs specified the options for horizontal line sources, constant wind speed with height, constant emission factors (hourly varying emissions were permitted by the coding change noted above), and averaging for each one-hour period. Mixing heights were set to 9999 meters for all model runs.

3.0 DESCRIPTION OF THE DATA SETS

Five mobile source field studies were acquired and archived for this model evaluation. The archive includes one cut-section and four at-grade data sets:

- CAL74 - California Department of Transportation Santa Monica Freeway - CO (cut-section)
- GM75 - General Motors Sulfate Dispersion Experiment SF_6 (at-grade)
- NYS76 - New York State Long Island Expressway - SF_6 (at-grade)
- NYS77 - New York State Long Island Expressway - CO (at-grade)
- SRI75 - SRI Highway 101 Santa Clara - CO (at-grade)

These 5 data sets were selected from the 13 described in a Transportation Research Board (TRB) report (Martinez, et al, 1982) for the following reasons:

- Each selected data set contains enough quality data to enable meaningful statistics to be generated for 1-hour and, in some cases, 8-hour averaging periods.
- Appropriate data were collected to provide the required inputs to each of the mobile models.
- The variety of data bases chosen allows model evaluation for both at-grade and cut-section roadways and for emissions of both CO and SF_6 tracer.
- Data collected in each study enable model evaluation over a wide range of meteorological conditions.

Originally, most of the data needed for the mobile model evaluation was to have come from the report and associated archive tape prepared for the Transportation Research Board (Martinez et al., 1982). However, in order to produce complete data sets which satisfy all input requirements of the models, information had to be gathered from several additional sources. For example, emissions for each CO data set were calculated using EPA's MOBILE2 or MOBILE3 emissions models based on traffic information at each site. Data were only

archived for hours containing complete information (source data, meteorology, and air quality) needed to run and evaluate each model. Data sources for all parameters archived or used as input to the emissions models are documented for each data set in the sections that follow.

3.1 California Department of Transportation - Santa Monica Freeway (1974)

The archive for the CAL74 Santa Monica Freeway cut-section data set includes 795 hours of data collected from April through July, 1974. The monitoring configuration is shown in Figure 3-1. Carbon monoxide concentrations measured at the six ground-level (1.5 meters) locations outside the cut-section were archived. Ambient wind speed and wind direction measured at the center of the median (6.7 meters above the top of the cut section and 14.0 meters above street level) were archived to provide the best available representation of transport above the cut. Hourly stabilities were determined from cloud cover and ceiling height observed at Los Angeles International Airport (about 15 kilometers from the site) and on-site wind speeds measured at 6.7 meters above the top of the cut section.

As described in Bemis, et al (1977), the Santa Monica Freeway site is removed from other localized pollutant sources. There are no additional freeways or main surface streets in the immediate area. The site is located in a mixed single-double story residential area, with homes ranging from 20 to 30 feet in height.

Data from the CAL74 Santa Monica Freeway mobile source study were gathered from several sources. Sources of all parameters archived or used in archiving are given below:

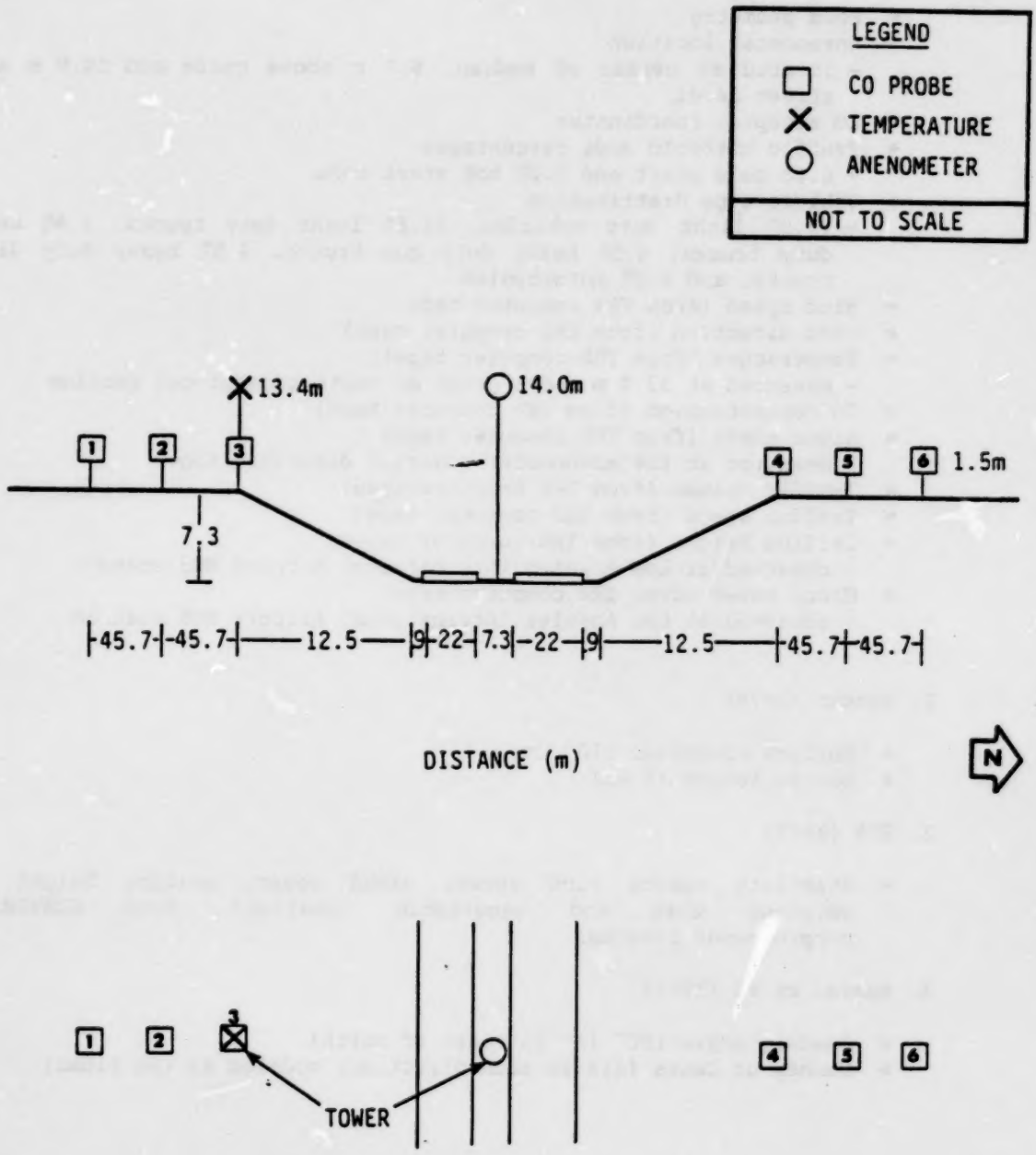

Figure 3-1. Monitoring configuration for the California Department of Transportation CO data base (CAL74-CO).

1. Martinez, et al (1982)

- Road geometry
- Anemometer location
  - located at center of median, 6.7 m above grade and 14.0 m above street level
- CO receptor coordinates
- Traffic hot/cold mode percentages
  - 6.0% cold start and 2.0% hot start mode
- Vehicle type distribution
  - 77.0% light duty vehicles, 11.6% light duty trucks, 1.4% medium duty trucks, 4.5% heavy duty gas trucks, 4.5% heavy duty diesel trucks, and 1.0% motorcycles
- Wind speed (from TRB computer tape)
- Wind direction (from TRB computer tape)
- Temperature (from TRB computer tape)
  - measured at 13.4 m above grade at south edge of cut section
- CO concentration (from TRB computer tape)
- Sigma theta (from TRB computer tape)
  - measured at the anemometer location described above
- Traffic volume (from TRB computer tape)
- Traffic speed (from TRB computer tape)
- Ceiling height (from TRB computer tape)
  - observed at Los Angeles International Airport NWS station
- Cloud cover (from TRB computer tape)
  - observed at Los Angeles International Airport NWS station

2. Benson (1979)

- Surface roughness (100 cm)
- Source length (5 km)

3. EPA (1977)

- Stability (using wind speed, cloud cover, ceiling height, sampling time and geographic location), from CRSTER preprocessor program.

4. Bemis, et al (1977)

- Roadway angle (80° 12' 53" east of north)
- Number of lanes (six in each direction; modeled as two links)

5. Calculated using MOBILE2 Emissions Model (EPA, 1981)

- CO Emission Factors
  MOBILE3 could not be used because it does not have an option for California emission factors. The following MOBILE2 input options were used:

  - Identical speed for all vehicle types, varying by hour
  - User supplied single VMT mix (from 1)
  - MOBILE2 default registration and mileage distributions
  - MOBILE2 default exhaust emission rates
  - No I/M program
  - No special correction factors
  - California emission factors
  - 1974 calendar year
  - Speeds, temperatures, and hot/cold mode percentages as given in TRB report

  MOBILE2 emission factors (grams/mile) were generated for each combination of speed (5 to 55 mph) and ambient temperature (20 to 95°F). They were then matched with the traffic speed (to the nearest mph for each direction of flow) and ambient temperature (rounded to the nearest 5°F) for each hour during which data were collected.

- CO Emission Rates
  Emission rates were obtained by multiplying the traffic volume (for each direction of flow) by the MOBILE2 emission factor (described above) for each hour of data collection. Emission rate units are grams/meter/second.

3.2 General Motors (1975)

The archive for the GM75 tracer data set contains SF_6 measurements for 62 periods of 30 minutes each from an at-grade oval test track at the GM Proving Ground in Milford, Michigan. The site diagram is shown in Figure 3-2. Tracer was released from seven or eight pickup trucks distributed evenly among 352 vehicles traveling on the track. Experiments were run during October, 1975.

As described in Cadle, et al (1976), the GM Proving Ground site is located in a rural area, surrounded by rolling hills and light woods. The site itself is essentially flat and open. The nearest major highways are located 7 km to the south and 6 km to the west.

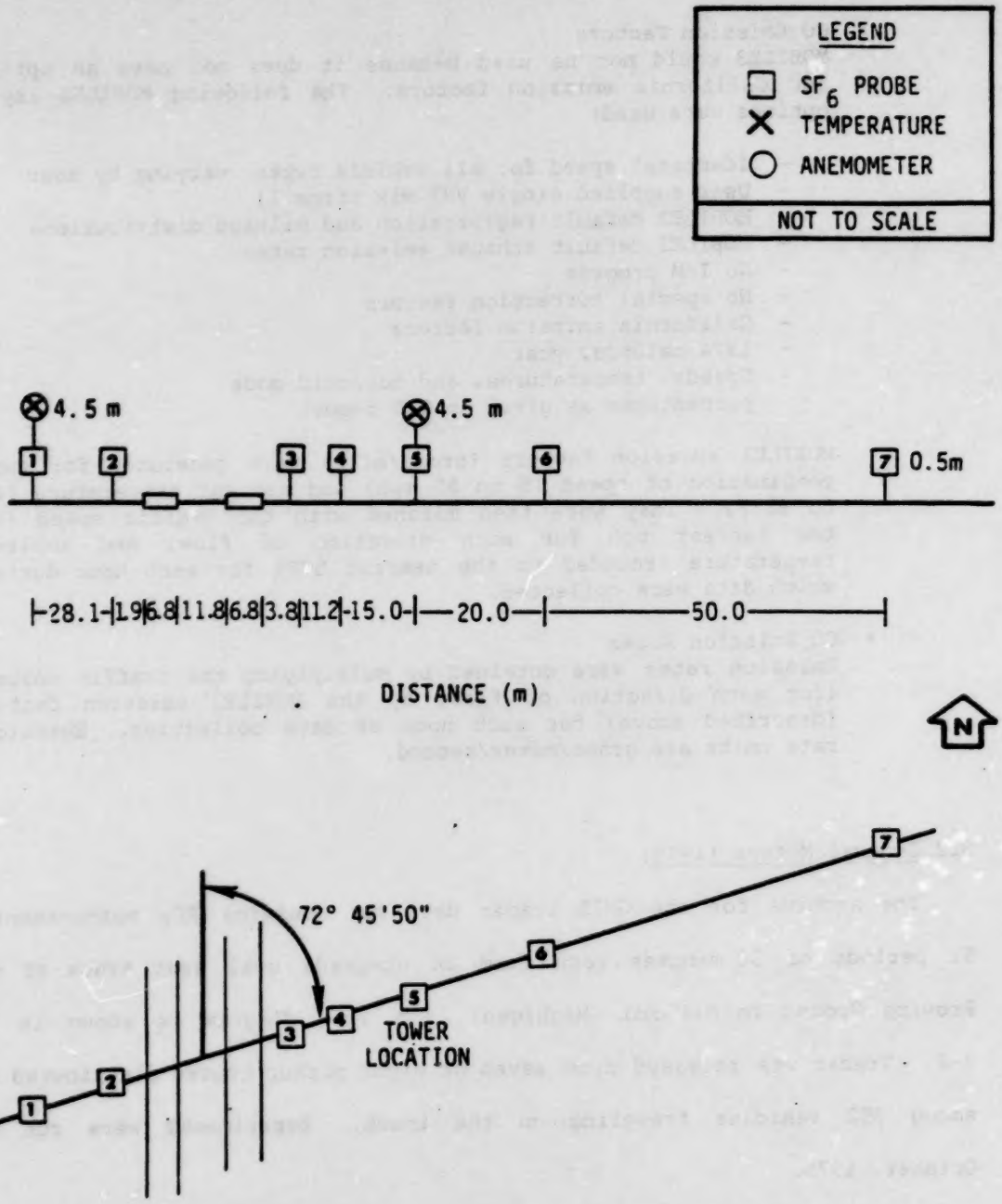

Figure 3-2. Monitoring configuration for the General Motors SF_6 data base (GM75-SF_6).

The GM archive contains half-hour averages of SF_6 concentration for the seven ground-level (0.5 meter), non-median monitoring locations. In addition, wind speed, wind direction, and temperature at a height of approximately 4.5 meters were archived from the tower located 30 meters upwind of the track (as determined for each sampling period) to represent ambient plume transport conditions not affected by the roadway. The archive also includes SF_6 emission rates for each sampling period.

Data from the General Motors Sulfate Dispersion Experiment were obtained from several sources. Hourly averages contained on the Transportation Research Board archive tape were not used in order to maintain the integrity of the original 30 minute averaging periods. Sources of all parameters archived for the mobile model evaluation are given below:

1. Chock (1977b)

   - Road geometry
   - Number of lanes (2 in each travel direction)
   - Traffic volume (equivalent of 5462 vehicles/hour, equally divided between 4 lanes)
   - Source length (5000 m)
   - Anemometer location (30 upwind of road, at a height of 4.5 m)

2. Chock (1977a)

   - Buoyancy flux (0.052 m^3/sec^3 for traffic volume stated above)

3. Chock (1977c)

   - Stability (local Golder stability used in the model runs; also archived Turner stability derived from Detroit Metropolitan Airport NWS data)
   - Surface roughness (3 cm)

4. Cadle, et al (1976)

   - SF_6 emission rates
   - SF_6 emission factors
   - SF_6 receptor locations
   - SF_6 ambient concentrations
   - Wind direction

- Wind speed
- Temperature (measured 30 m upwind of road, at a height of 4.5 m)
- Ambient pressure

3.3 New York State Long Island Expressway - CO (1977)

A total of 303 hours of data were archived from an at-grade site along the Long Island Expressway in New York State. The NYS77 study was conducted during April and May, 1977. Figure 3-3 shows the site arrangement for this study. Carbon monoxide concentrations from three ground-level (2 meter height), non-median monitor locations were included in the archive. Wind speed and wind direction recorded at a height of 2 meters on a tower located 37 meters north of the road edge were archived to represent ambient plume-level transport conditions. Ambient temperature, measured at a height of 4 meters, 21.5 south of the road edge, was also archived.

As described in Rao, et al (1978), the Long Island Expressway site is situated in a relatively flat and open area, surrounded by sod farms. A small grove of trees is located 200 meters to the south. The nearest major roads are located approximately 0.5 and 1.5 km to the west of the site.

Data from the NYS77 Long Island Expressway CO field study were gathered from several sources. Sources of all parameters archived are given below:

1. Martinez, et al (1982)

   - Traffic volumes and speeds (averages based on time of day and day of week)
   - Traffic hot/cold start mode percentages
     - 0% hot and 0% cold mode.
   - Vehicle type distribution (81% light duty vehicles, 9% light duty trucks, 6.5% heavy duty gas trucks, and 3.5% heavy duty diesel trucks)
   - Wind speed (from TRB computer tape)

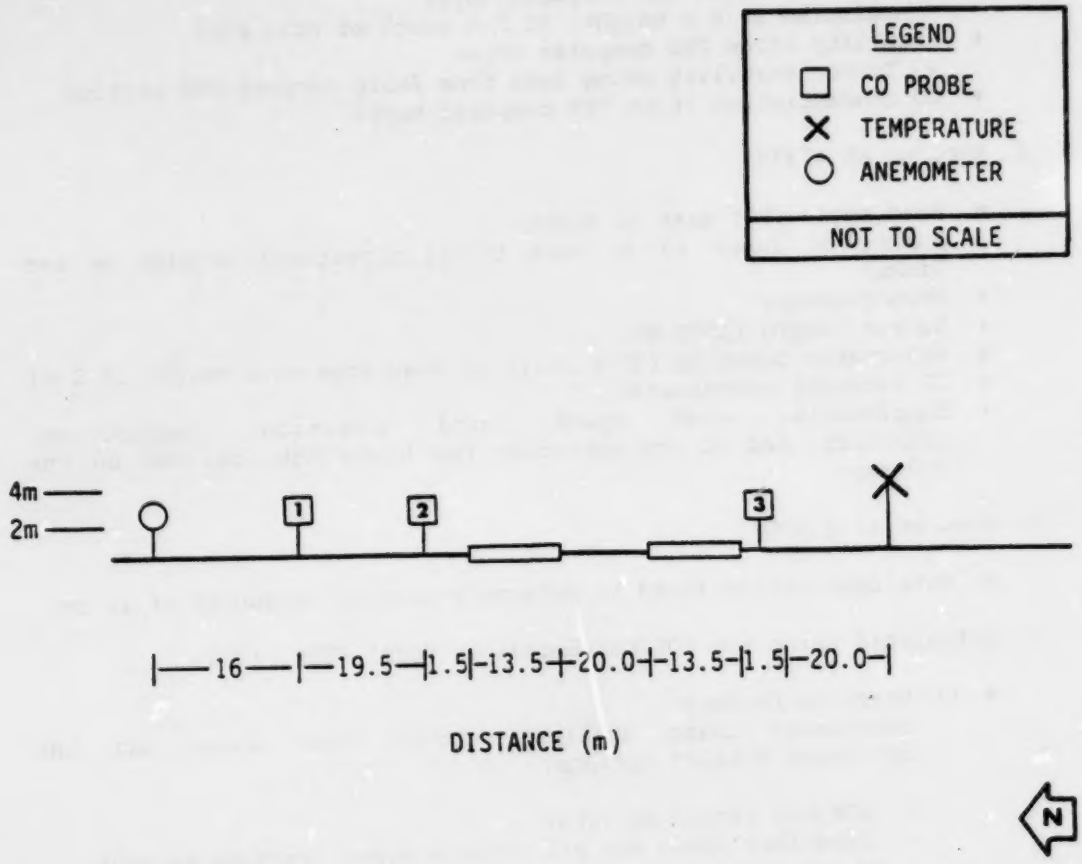

Figure 3-3. Monitoring configuration for the New York CO data base (NYS77-CO).

- Wind direction (from TRB computer tape)
- Temperature (from TRB computer tape)
  - measured at 4 m height, 21.5 m south of road edge
- Stability (from TRB computer tape)
  - Turner stability using data from Islip Airport NWS station
- CO concentration (from TRB computer tape)

2. Rao, et al (1979)

- Road angle (90° east of north)
- Number of lanes (3 in each travel direction; modeled as two links)
- Road geometry
- Source length (1500 m)
- Anemometer location (37 m north of road edge at a height of 2 m)
- CO receptor coordinates
- Supplemental wind speed, wind direction, temperature, stability, and CO concentration for hours not included on the TRB tape

3. Rao, et al (1978)

- Site description (used to determine surface roughness of 10 cm)

4. Calculated using the MOBILE3 Emissions Model (EPA, 1984)

- CO Emission factors
  Determined using available inputs from above and the following MOBILE3 options:

  - MOBILE3 tampering rates
  - Identical speed for all vehicle types, varying by hour
  - User supplied single VMT mix (from TRB report)
  - MOBILE3 default registration and mileage distributions
  - MOBILE3 default exhaust emission rates
  - No I/M program
  - No special correction factors
  - No anti-tampering program
  - Low altitude emission factors
  - 1977 calendar year
  - Speeds, temperatures, and hot/cold mode percentages as given in TRB report

  MOBILE3 emission factors (grams/mile) were generated for each combination of speed (5 to 55 mph) and ambient temperature (20 to 95°F). They were then matched with the average traffic speed (to the nearest mph) for each direction of flow (by hour and day of week) and ambient temperature (rounded to the nearest 5°F) for each hour during which data were collected.

- CO Emission rates
  Emission rates were obtained by multiplying the traffic volume (for each direction of flow) by the MOBILE3 emission factor (described above) for each hour of data collection. Emission rate units are grams/meter/second.

3.4 New York State Long Island Expressway - SF_6 (1976)

The NYS77 CO program was preceded by NYS76, a series of SF_6 tracer experiments in October and November 1976. From these experiments, a total of 21 hours of complete data were available. SF_6 concentrations from eight ground level (2 meter) non-median monitor locations were included in the archive. These locations are shown in Figure 3-4.

Data from the 1976 tracer study were gathered from two references as given below:

1. Rao, et al (1979)

   - Road angle (90° east of north)
   - Number of lanes (3 in each travel direction; modeled as two links)
   - Road geometry
   - Source length (1160 m)
   - Anemometer location (center of median at 8 m height)
   - Wind speed
   - Wind direction
   - Turner stability
   - Local stability (used in model runs)
   - SF_6 emission rates (determined by dividing hourly emissions (g) by source length (1160 m) and then by time length of run (3600 sec))
   - SF_6 ambient concentrations
   - SF_6 receptor coordinates

2. Rao, et al (1978)

   - Site description (used to determine surface roughness of 10 cm)

3.5 SRI Highway 101 (1975)

The archived SRI75 data set is made up of 45 hours of data collected on six days in January and February, 1975 at an at-grade site (see Figure 3-5) along Highway 101 in Santa Clara, California. Carbon monoxide concentrations at 22 non-median receptor locations (18 at a height of one meter and 4 at a height of three meters) were archived. Ambient wind speed and wind direction, measured at a height of 3.8 meters on towers located 30.5 meters upwind of the

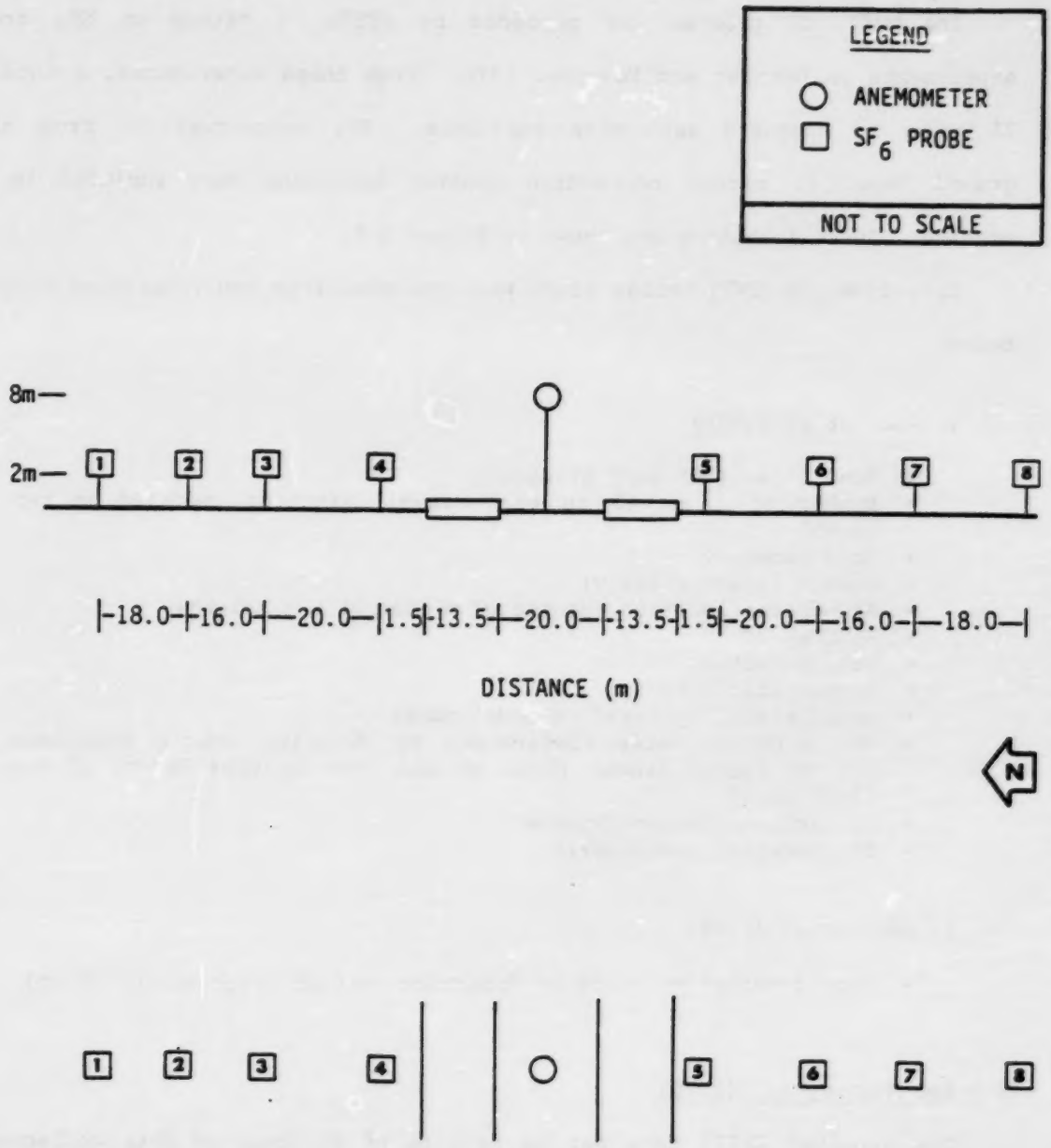

Figure 3-4. Monitoring configuration for the New York SF_6 data base (NYS76-SF_6).

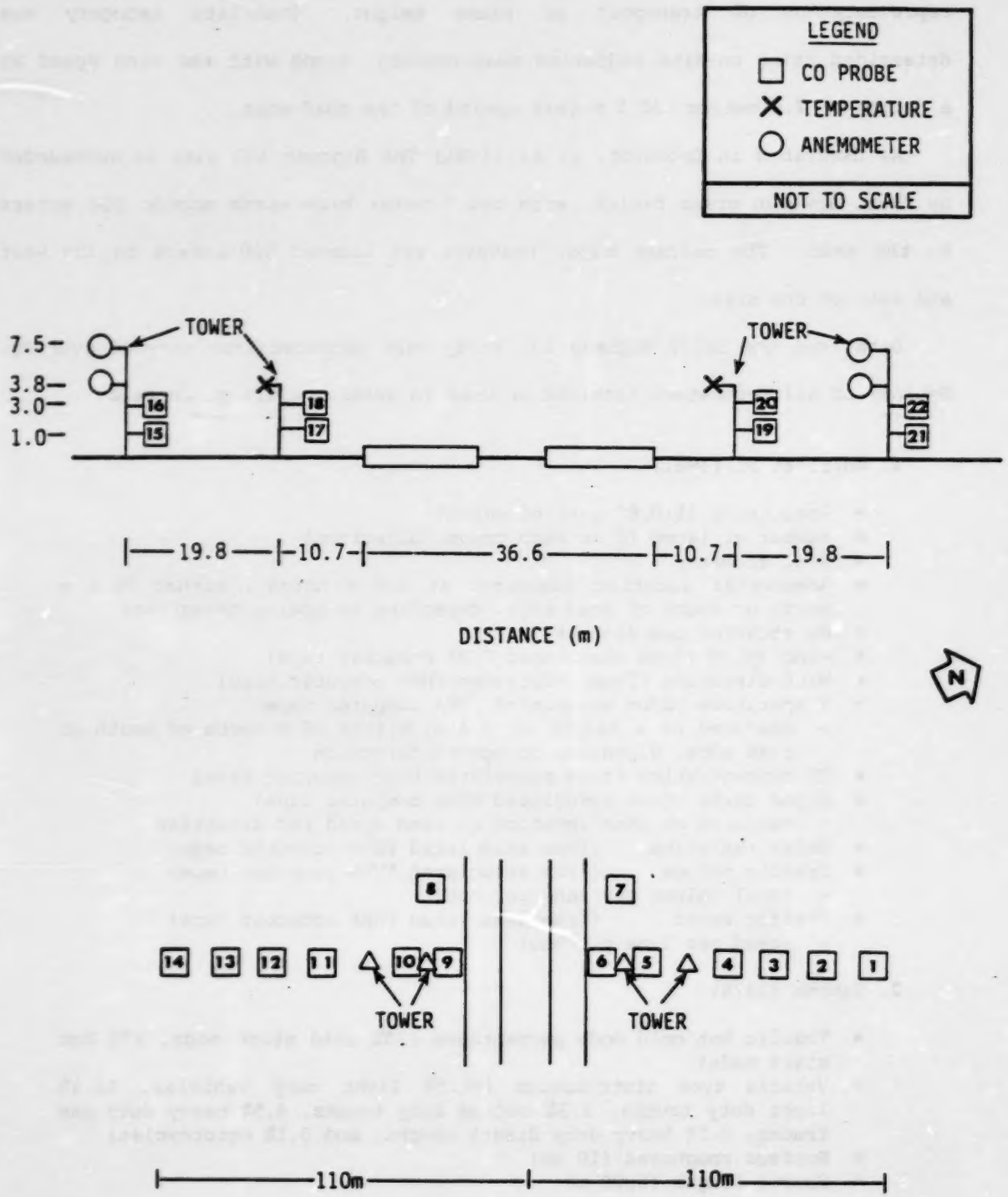

Figure 3-5. Monitoring configuration for the SRI CO data base (SRI75-CO). CO probes shown in the lower diagram are at a height of 1 meter.

road edge, were included in the archive to provide the best available ambient representation of transport at plume height. Stability category was determined using on-site radiation measurements, along with the wind speed at a height of 7.5 meters, 30.5 meters upwind of the road edge.

As described in Dabberdt, et al (1981) The Highway 101 site is surrounded by flat, low-cut grass fields, with two 7 meter high earth mounds 350 meters to the east. The nearest major roadways are located 500 meters to the west and east of the site.

Data from the SRI75 Highway 101 study were gathered from several sources. Sources of all parameters archived or used in archiving are given below:

1. Wolf, et al (1981)

   - Road angle (110.6° east of north)
   - Number of lanes (3 in each travel direction)
   - Road geometry
   - Anemometer location (measured at 3.8 m height, either 30.5 m north or south of road edge, depending on upwind direction)
   - CO receptor coordinates
   - Wind speed (from associated FHWA computer tape)
   - Wind direction (from associated FHWA computer tape)
   - Temperature (from associated FHWA computer tape)
     - measured at a height of 3.8 m, either 30 m north or south of road edge, depending on upwind direction
   - CO concentration (from associated FHWA computer tape)
   - Sigma theta (from associated FHWA computer tape)
     - measured at same location as wind speed and direction
   - Solar radiation (from associated FHWA computer tape)
   - Traffic volume (from associated FHWA computer tape)
     - total volume per lane per hour
   - Traffic speed (from associated FHWA computer tape)
     - speed per lane per hour

2. Benson (1979)

   - Traffic hot/cold mode percentages (20% cold start mode, 27% hot start mode)
   - Vehicle type distribution (81.5% light duty vehicles, 12.1% light duty trucks, 1.3% medium duty trucks, 4.5% heavy duty gas trucks, 0.5% heavy duty diesel trucks, and 0.1% motorcycles)
   - Surface roughness (10 cm)
   - Source length (6000 m)

3. Calculated using the method described by Ludwig and Dabberdt (1976)

- Stability (using solar radiation, 7.5 m height wind speed from FHWA tape, and calculated sun angle)

4. Calculated using the MOBILE2 Emissions Model (EPA, 1981)

   - CO Emission Factors

     MOBILE3 could not be used because it does not have an option for California emission factors. The following MOBILE2 input options were used:

     - Identical speed for all vehicle types, varying by hour
     - User supplied single VMT mix (from CALINE3 User's Guide)
     - MOBILE2 default registration and mileage distribution
     - MOBILE2 default exhaust emission rates
     - No I/M program
     - California emission factors
     - 1975 calendar year
     - Speeds, temperatures, and hot/cold mode percentages as given by the FHWA tape and CALINE3 User's Guide

   MOBILE2 emission factors (grams/mile) were generated for each combination of speed (5 to 55 mph) and ambient temperature (20 to 95°F). They were then matched with the traffic speed (to the nearest mph) for each lane and ambient temperature (rounded to the nearest 5°F) for each hour during which data were collected.

- CO Emission Rates

  Emission rates were obtained by multiplying the traffic volume (for each lane) by the MOBILE2 emission factor (described above) for each hour of data collection. Emission rate units are grams/meter/second.

4.0 STATISTICS APPROACH

The 1980 AMS Woods Hole Workshop on model performance evaluation (Fox, 1981) recommended a comprehensive list of performance measures and statistics for evaluating air quality models. The workshop recommended that performance evaluations be based on comparisons of the full set of observed-predicted data pairs, of the highest observed and predicted concentrations per event (e.g., 1 or 8 hour time period), and of the highest "N" values (unpaired in time or space). In addition, comparisons of observed and predicted concentrations for data subsets representing individual monitoring stations or selected meteorological conditions were recommended.

The statistical analyses performed for the mobile source model category are based upon the recommendations of the 1980 AMS Workshop, together with insights gained through evaluations of rural (Londergan, et al, 1982), urban (Londergan, et al, 1983), and complex terrain (Wackter and Londergan, 1984) model categories. The intent of the statistical analysis is to provide a thorough assessment of model performance, avoiding redundant or uninformative calculations.

4.1 Pre-Analysis Data Handling Procedures

A number of issues concerning analysis procedures can be addressed on a generic basis, without regard for the differences among the selected data sets. These issues include the selection of monitors; estimation of background concentrations; averaging times; use of a concentration threshold; and choice of meteorological subsets. Additional analysis issues must also be discussed for the cut-section data set.

Monitor Selection. For regulatory applications, ambient concentrations at ground level (or "breathing height") are the primary concern. Likewise,

monitors located in the median of limit-access highways are not of concern for the current evaluation. For the present study, analysis was restricted to near-ground monitors, and excluded monitors in the median of a divided highway.

The SRI - at grade monitoring program utilized an array of 22 monitors which were symmetrically located on both sides of the highway. Because the models simulate transport and dispersion identically on both sides of the roadway, the 11 sets of "twin" stations on opposite sides of the roadway were treated as single stations for the "by station" subsets. This enabled a reduction in the volume of statistics generated without any loss of information, as well as an increase in the population sample size for those statistics which were generated.

Background Concentrations. Each of the measurement programs included monitors on both sides of the roadway. Background CO concentrations were assumed to be evenly distributed over the study area and were estimated by the lowest measured concentration in the network each hour. Observed concentration values were calculated as the measured minus the background concentration. A background level of zero ppb was assumed for the SF_6 data sets.

Averaging Times. National ambient air quality standards for carbon monoxide exist for 1-hour and 8-hour averaging times. The basic prediction unit for the models under consideration is one hour. The selected data sets, except GM75, provide one-hour measurements of ambient concentrations, traffic,

and meteorological variables. The GM75 data set is made up of half-hour measurements. Statistical analyses were performed for half-hour (GM75 data set only), 1-hour (all other data sets) and 8-hour averaging periods (CAL74 and NYS77-CO data sets only). A minimum of 6 hours of data were required to estimate the 8-hour averages. Background values for the 8-hour data sets were determined by calculating the average of the 8 individual hourly background values.

Threshold. Near-zero observed and predicted concentration values are not of great interest for testing model performance. For the mobile source data sets, monitors located upwind of the roadway generally show negligible impact from roadway emissions. To eliminate these data points from the statistical analyses, a screening threshold of 0.5 ppm for CO, after background removal, was used for the one-hour averaging period. This value represents a characteristic measurement uncertainty as determined for an experimental program in Texas (Bullin, et al, 1978). When both the observed and predicted CO concentrations at a monitor were below this threshold for a given hour, that data pair was eliminated from the data set. No threshold screening was performed for 8-hour CO averages or for SF_6 concentrations.

Meteorological Subsets. The key meteorological variables for estimating pollutant concentrations within 25 m of a highway are wind speed and wind angle (wind direction, relative to the highway direction). As the distance from the roadway increases, atmospheric stability becomes increasingly important. Meteorological subsets selected for statistical analysis are summarized below:

- Wind Speed (u): $u \leq 2$ m/s
  $2 < u \leq 4$ m/s
  $u > 4$ m/s

- Wind Angle (θ): $\theta \leq 20°$ (near parallel)
  $20° < \theta \leq 60°$ (oblique)
  $\theta > 60°$ (near perpendicular)

- Stability: unstable (Class A, B, C)
  neutral (Class D)
  stable (Class E, F, G)

Cut-Section Data Set (CAL74). Review of model provisions in HIWAY-2 suggests that predictions are only meaningful for receptor locations outside of the cut-section. GMLINE and PAL were not developed to treat cut-sections, although PAL does allow the user to vary initial mixing on input. CALINE3 is the only model which allows receptors to be located within the cut. Consequently, only the six ground-level monitors outside of the cut were used to test model performance for the CAL74 Santa Monica data set. The CO measurements were not taken simultaneously at all of the monitoring stations for all measurement periods. To use any hour for statistical analysis, CO concentrations at both upwind (to estimate background) and downwind locations outside of the cut must have been available.

4.2 Statistical Performance Measures

The AMS workshop report recommended two somewhat different lists of performance measures for comparing model predictions with observed air quality, one appropriate for data sets representing pairs of observed and predicted values, the other appropriate for unpaired data sets. Paired data sets provide a means for assessing how well a model predicts on an event-by-event basis, while unpaired sets do not. Table 4-1 summarizes the basic list of performance measures, and the statistical methods recommended for establishing confidence limits on each measure.

For data sets paired in time, statistical analyses based on residuals (i.e., the differences between each pair of observed and predicted values) are

TABLE 4-1

STATISTICAL ESTIMATORS AND BASIS FOR CONFIDENCE LIMITS ON PERFORMANCE MEASURES

Performance Measure	Estimator	Basis for Confidence Interval	
		Paired Comparison	Unpaired Comparison
Bias	Average	One sample "t," with adjustment for serial correlation	Two sample "t"
	Median	Wilcoxon match pair	Mann-Whitney
Noise/Scatter	Variance	Chi-squared test on variance of residuals	F test on variance ratio
	Gross variability	None	Not applicable
	Average absolute residual	None	Not applicable
Correlation	Pearson correlation coefficient	Fisher "z"	Not applicable
Frequency distribution comparison	Maximum difference between two cumulative distribution functions	Not Applicable	Kolmogorov-Smirnov (K-S) test on f (obs.) vs. f (pred.)

appropriate for measuring model performance. If the time pairing for these data sets is ignored, however, it is also possible to assess model performance (in aggregate) by comparing the features of the composite set of all observed values to those of the predicted values. Consequently, both paired and unpaired comparisons were recommended by the AMS workshop for these data sets. Data sets representing comparisons of the highest values, regardless of time or space, provide no basis for paired analysis. For these sets only unpaired comparisons were performed.

For paired comparisons, as noted above, the performance measures are based on an analysis of residuals. Model bias is indicated by the average and/or the median residual, with a value of zero representing no bias. The characteristic magnitude of the residuals is an indicator of the scatter between observed and predicted values on an event-by-event basis. Three measures of noise or scatter were computed:

- Variance $\frac{1}{N-1} \sum_i (d_i - \bar{d})^2$
- Gross variability $\frac{1}{N} \sum_i d_i^2$
- Average absolute residual $\frac{1}{N} \sum_i |d_i|$

where d_i is the residual (observed minus predicted) for data pair i, d is the average residual, and N is the number of data pairs. The correlation of paired observed and predicted values is measured by the Pearson correlation coefficient.

For unpaired comparisons, the list of performance measures is somewhat shorter. Model bias is indicated by the difference between the average (or

median) observed value and the average (median) predicted value. A ratio of the variances of the observed and predicted values is provided to indicate whether the distribution of values in the two data sets is comparable. Similarly, the frequency distribution of observed values is compared with that for predicted values.

Standard statistical methods were used to estimate confidence limits for each of the performance measures. Discussion of the statistical procedures may be found in most statistics textbooks. For parametric procedures, the reader is referred to Snedecor and Cochran (1967), while for nonparametric procedures Hollander and Wolfe (1973) provide an appropriate description.

For paired comparisons, the confidence interval on the average residual was estimated using the one-sample t test. This parametric test incorporates the assumption that the residuals follow a normal distribution, but for large N departures from normality are not critical. Serial correlation can affect results, since the number of "independent events" could be overestimated and the calculated variance could understate the magnitude of the actual random error component. However, for the mobile data sets, this effect should be minimized since much of the data is not continuous in time.

An analogous nonparametric indicator of model bias is the median residual. The statistical method for estimating a confidence interval on the median residual is provided by the Wilcoxon matched-pairs test. No straightforward method of adjusting the confidence intervals from the Wilcoxon test for serial correlation has been identified.

A confidence interval for the variance of the residuals was calculated using a chi-squared test. No adjustment was made for serial correlation. No standard method is available for estimating confidence intervals for the gross variability or average absolute deviation measures. For the Pearson correlation coefficient, the Fisher z test provided a method of estimating the confidence interval.

Comparison of two cumulative distribution functions was accomplished using the Kolmogorov-Smirnov (K-S) test. For this test, the two distribution functions are compared across the full range of concentration (or residual) values, and the maximum frequency difference between the two functions is identified.

For unpaired comparisons, two bias measures were computed. The average of the observed values was compared with the average of the predicted values. The confidence interval on the difference of the averages was estimated with a two-sample t test. The median difference was also computed, and the confidence interval was estimated using the Mann-Whitney nonparametric test.

The variance of observed values was compared with the variance of predicted values for unpaired data sets. The performance measure is the ratio of the variances; the F test provides confidence limits on the ratio. The frequency distribution comparison for unpaired data sets provided a measure of the difference between the observed and predicted distribution functions. The K-S test was again used to assess the statistical significance of the maximum frequency difference.

4.3 Data Sets For Statistical Analysis

Twenty basic data sets were compiled as a product of the data from the five field programs run through each of the four mobile models. Each of these basic data sets were screened and processed for missing data, threshold,

background and averaging times as described above and then sorted into subsets by station and meteorological conditions. Various unpaired and paired data groups were then developed for subsequent statistical analysis.

The statistical measures generated for the mobile source model evaluation are very similar to those utilized for the urban and complex terrain model evaluations, except for some of the selected data sets the amount of available experimental data limited the extent of the analyses. Statistical measures are discussed separately for the unpaired (N highest values) and paired data sets.

Unpaired (N Highest Values). The array of statistical analyses performed for the N highest observed and predicted values, regardless of time or location, are summarized in Table 4-2. The principal change from earlier model categories concerns the choice of N, the number of peak values analyzed. Previously, this number had been fixed at 25. In light of the small number of measurement hours available for three of the data sets, the number of peak values analyzed in this study was reduced to 25 percent of the available hours or 25 hours, whichever was less. (Otherwise, the data set would not accurately reflect the "top end" of the frequency distribution.) To reduce spatial correlation, not more than one observed and predicted value from any hour was chosen. This prevented the high-N analysis from being unduly influenced by one or two hours of overall high concentrations. The confidence intervals for these data sets are based upon a two-sample t-test. These confidence intervals should be viewed with caution, since the N highest values are selected based on their rank within the distribution. The data set, therefore, does not represent a random sample of N independent values.

As noted previously, data from "twin" stations from the SRI data set were combined for the subset analysis by station. Meteorological subsets for the one-hour data were also defined in an earlier discussion.

TABLE 4-2

ARRAY OF PERFORMANCE MEASURES AND STATISTICS CALCULATED FOR THE "N" HIGHEST (UNPAIRED) MOBILE DATA SETS (WHERE N IS THE LESSER OF 25 OR 25%)

	Average Observed	Average Predicted	Difference of Averages	Difference of Medians	Variance Ratio	Frequency Distribution
All stations/ all events	X	X	X (C.I.)*	X (C.I.)	X (C.I.)	X
By station all events	X	X	X (C.I.)	X (C.I.)	X (C.I.)	X
Subsets by meteorological Conditions	X	X	X (C.I.)	X (C.I.)	X (C.I.)	X

* C.I. = 95% confidence interval

Analysis of the "highest N" 8-hour average values was only undertaken for the CAL74 cut-section and NYS77 CO data sets. For the New York data set, fewer than 100 8-hour periods were available, so the selected N value was 25 percent of the available number, rather than 25. Statistics for meteorological subsets were not computed for the 8-hour data sets.

Paired in Time and/or Location

Statistical analyses undertaken for paired data sets are summarized in Table 4-3. The first two columns represent subsets of the full basic data set. For column one, the highest observed and predicted values are selected for each time period (paired in time but not necessarily in space), and then analyzed statistically as a group. Similarly the highest observed and predicted values at each station for the period of record (data paired by station but not necessarily in time) are grouped for statistical analysis in column two. The full basic data set is represented in column three by the group of all observed and predicted values paired for each time period at each station. Fully paired comparisions are also made for observed and predicted concentrations at each station (column four) and for each meteorological data subset (column five).

TABLE 4-3

ARRAY OF PERFORMANCE MEASURES AND STATISTICS CALCULATED FOR THE MOBILE DATA SETS PAIRED IN TIME OR LOCATION

	Highest per event paired in time	Highest per station paired by location	All Data paired in time and location	All Events at each station paired in time	Meteorological Subsets of events paired in time and location
Number of events	X	X	X	X	X
Averaged observed	X	X	X	X	X
Average Predicted	X	X	X	X	X
Difference of Averages	X (C.I.)*	-	X (C.I.)	X (C.I.)	X (C.I.)
Average difference	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)
Fraction Co > Cp	X	X	X	X	X
Characteristics Discrepancies					
σd	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)
RMSE	X	X	X	X	X
AAD	X	X	X	X	X
Correlation coefficient Pearson R	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)	X (C.I.)
Variance comparison	X (C.I.)	-	X(C.I.)	X (C.I.)	X (C.I.)
Maximum frequency difference	X (C.I.)	-	X(C.I.)	X (C.I.)	X (C.I.)

* C.I. = 95% confidence interval

5.0 MODEL PERFORMANCE RESULTS

Statistics comparing observed and predicted concentrations were generated for each combination of the four mobile source models and five data bases using the approach described in Section 4.0. Statistics were produced for the "N" highest observed and predicted values, highest concentrations by event, highest concentrations by station, and all observed and predicted concentrations paired in space and time. A summary of results for each of these data groupings is presented in this section. Complete tables of statistics, including breakdowns by station and meteorological subset, are presented in Appendices A through D.

5.1 Statistics for "N" Highest Values

One-Hour

Summary statistics for the "N" highest observed and "N" highest predicted 1-hour average CO and SF_6 concentrations are presented in Table 5-1 for each model and data base. Because some of the data bases are fairly small, the value of "N" for each data set was determined by selecting either the highest 25 percent or highest 25 concentration values, whichever was less. Caution should be exercised when interpreting the meaning of statistics generated using the smaller data sets.

The number of events used to calculate statistics for each model and data base is given in the first column of Table 5-1. Averages of the "N" highest observed and predicted values for each data set are listed in columns two and three, respectively. The first performance measure, presented in column four, is the difference between the two averages. A positive value implies model underprediction. In parentheses adjacent to the calculated differences are 95 percent confidence intervals, determined by using the two-sample Student's t test. Confidence limits which contain zero imply that there is no significant

TABLE 5-1
COMPARISON OF "N" HIGHEST OBSERVED
AND PREDICTED ONE HOUR CONCENTRATION VALUES*
(UNPAIRED IN TIME OR LOCATION)

DATA SET AND MODEL	NUMBER OF EVENTS** ("N")	AVERAGE OBSERVED VALUE (CO)	AVERAGE PREDICTED VALUE (CP)	DIFFERENCE OF AVERAGES*** (CO - CP)	DIFFERENCE OF MEDIANS*** (CO - CP)	VARIANCE COMPARISON*** (SO**2/SP**2)
1. GM75 - SF6 (PPB)						
GMLINE	16	3.4	3.3	.1 (-.3, .4)	.1 (-.3, .4)	1.03 (.36, 2.95)
CALINE3	16	3.4	5.3	-1.9 (-4.3, .6)	-.9 (-1.3, -.4)	.01 (.00, .03)
PAL	16	3.4	5.2	-1.9 (-2.8, -.9)	-1.3 (-3.0, -.6)	.08 (.03, .24)
HIWAY2	16	3.4	3.5	-.1 (-.4, .3)	.0 (-.4, .3)	1.11 (.39, 3.18)
2. HYS76 - SF6 (PPB)						
GMLINE	5	8.6	9.1	-.5 (-2.6, 1.5)	.2 (-3.1, 2.1)	.48 (.05, 4.56)
CALINE3	5	8.6	9.6	-1.0 (-3.4, 1.4)	-1.4 (-3.4, 1.7)	.33 (.03, 3.12)
PAL	5	8.6	11.3	-2.7 (-6.5, 1.2)	-1.2 (-8.0, .7)	.12 (.01, 1.17)
HIWAY2	5	8.6	11.4	-2.8 (-4.7, -.9)	-2.4 (-5.4, -.5)	.59 (.06, 5.66)
3. SRI75 - CO (PPM)						
GMLINE	11	7.8	7.6	.2 (-1.7, 2.0)	1.0 (-1.6, 2.3)	1.16 (.31, 4.30)
CALINE3	11	7.8	5.5	2.2 (.3, 4.1)	3.5 (.5, 4.7)	1.04 (.28, 3.88)
PAL	11	7.8	15.2	-7.4 (-13.8, -.9)	-4.0 (-9.0, -1.0)	.05 (.01, .20)
HIWAY2	11	7.8	9.8	-2.0 (-4.8, .7)	-1.0 (-4.7, 1.2)	.35 (.09, 1.29)
4. HYS77 - CO (PPM)						
GMLINE	25	4.7	7.1	-2.4 (-3.2, -1.6)	-2.3 (-2.8, -1.4)	.17 (.08, .40)
CALINE3	25	4.7	17.2	-12.5 (-15.1, -10.0)	-11.8 (-12.3, -9.5)	.01 (.01, .03)
PAL	25	4.7	42.0	-37.3 (-49.9, -24.7)	-27.3 (-36.5, -21.3)	.00 (.00, .00)
HIWAY2	25	4.7	13.4	-8.7 (-11.7, -5.6)	-7.0 (-8.1, -5.0)	.01 (.00, .02)
5. CAL74 - CO (PPM)						
GMLINE	25	10.8	1.5	9.4 (8.7, 10.0)	9.2 (8.4, 9.8)	24.67 (10.87,55.99)
CALINE3	25	10.8	3.3	7.5 (6.5, 8.5)	7.8 (6.9, 8.3)	.69 (.31, 1.57)
PAL	25	10.8	12.5	-1.7 (-5.2, 1.9)	1.6 (-1.5, 2.8)	.03 (.02, .08)
HIWAY2	25	10.8	2.9	7.9 (7.3, 8.6)	8.0 (7.0, 8.5)	5.32 (2.34,12.06)

* GM75 DATA ARE HALF-HOUR AVERAGES
** LESSER OF 25 OR 25% OF TOTAL EVENTS
*** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

difference between modeled and observed concentrations at the 95 percent confidence level.

Results for the "difference of averages" comparison, as displayed graphically in Figure 5-1, show differences both between models and between data bases. The best model performance occurs with the two tracer data bases, GM75 and NYS76. Little bias is observed for these two data bases except with the PAL and HIWAY-2 models which show significant overpredictions for GM75 and NYS76, respectively. The least bias and smallest confidence bounds are exhibited by GMLINE. In general, much poorer model performance is exhibited for the three CO data bases. GMLINE performed best for both at-grade data sets (NYS77 and SRI75) while PAL performed worst. The cut-section data base (CAL74) appears to be an exception, with large underpredictions by three of the models and unbiased performance by PAL.

The second performance measure shown in Table 5-1 is the difference of medians between ranked pairings of the "N" highest observed and predicted concentrations. It should be noted that the 95 percent confidence interval is determined with the nonparametric Mann-Whitney test for the median difference. Results for the difference of medians are very similar to those for the difference of averages.

The last performance measure shown in Table 5-1 is the variance comparison. This statistic was obtained by dividing the variance of the "N" highest observed values by the variance of the "N" highest predicted concentrations. A quotient of 1 indicates equal scatter of observed and predicted concentrations. The F test was used to calculate the 95 percent confidence levels. Results of the variance comparison for the at-grade data sets vary. Of the at-grade data sets, the most notable observation is that the models tend to predict with much more variability than the observed data (values less than 1). The GMLINE model performed relatively better than the

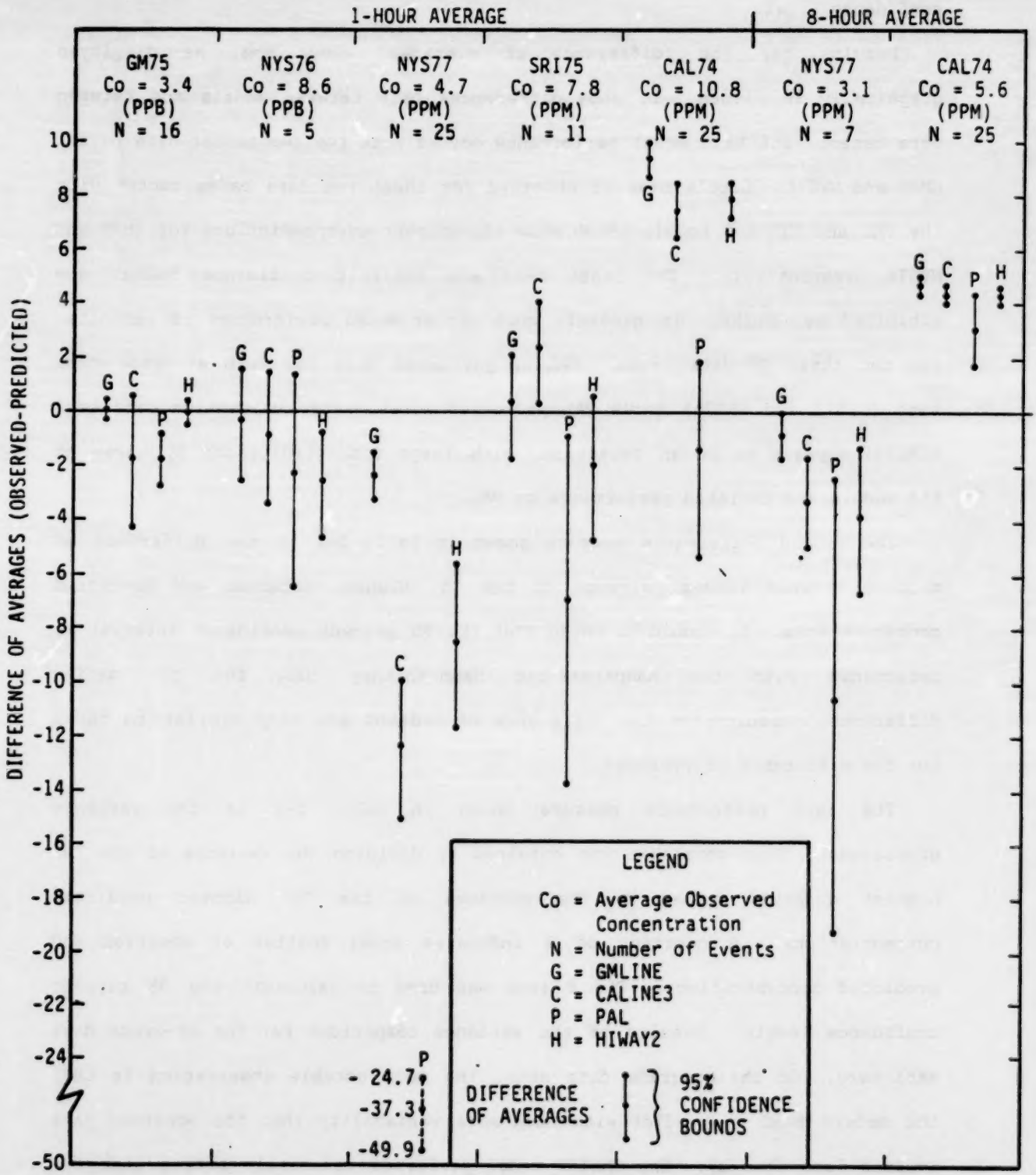

Figure 5-1. Difference of averages of highest "N" observed and predicted one hour concentrations.

other models while PAL performed poorest; however the 95 percent confidence intervals on this measure are fairly large. For the cut-section data set (CAL74), only CALINE3 predicted with a variance comparable to the observed variance, while GMLINE and HIWAY-2 predicted with much less variability than observed.

Eight-Hour

Summary statistics for the "N" highest observed and predicted 8-hour average CO concentrations are presented in Table 5-2 and Figure 5-1 for the two largest data bases (NYS77 and CAL74). In general, the 8-hour model results show the same tendencies as the 1-hour results. For the at-grade data set (NYS77), only the GMLINE model produces results which are not significantly different from observed concentrations for any performance measure listed. The other models all overpredict by a significant margin and produce much more scatter than observed.

For the cut-section data base (CAL74), all of the models underpredict significantly at the 95 percent level of confidence, as indicated by both the difference of averages and difference of medians. Only HIWAY2 produces a variance similar to the observed variance. The GMLINE model displays less scatter than observed while both CALINE3 and PAL produce more scatter than observed.

5.2 Statistics for Highest Concentration by Event

A second statistical grouping compares the highest observed and predicted concentrations over the monitoring network for each sampling period, paired in time (i.e., one pair of values for each sampling period). Statistics were generated for both 1-hour and 8-hour sampling periods.

TABLE 5-2
COMPARISON OF "N" HIGHEST OBSERVED
AND PREDICTED EIGHT HOUR CONCENTRATION VALUES
(UNPAIRED IN TIME OR LOCATION)

DATA SET AND MODEL	NUMBER OF EVENTS* ("N")	AVERAGE OBSERVED VALUE (CO)	AVERAGE PREDICTED VALUE (CP)	DIFFERENCE OF AVERAGES** (CO - CP)	DIFFERENCE OF MEDIANS** (CO - CP)	VARIANCE COMPARISON** (SO**2/SP**2)
1. NYS77 - CO (PPM)						
GMLINE	7	3.1	3.9	-.8 (-1.7, .0)	-1.2 (-1.8, .0)	.41 (.07, 2.39)
CALINE3	7	3.1	6.4	-3.3 (-5.0, -1.7)	-3.2 (-5.3, -1.7)	.09 (.02, .52)
PAL	7	3.1	13.9	-10.8 (-19.3, -2.4)	-7.3 (-21.8, -3.5)	.00 (.00, .02)
HIWAY2	7	3.1	7.0	-3.9 (-6.7, -1.2)	-3.1 (-7.4, -1.4)	.03 (.01, .19)
2. CAL74 - CO (PPM)						
GMLINE	25	5.6	.7	4.8 (4.6, 5.1)	4.7 (4.6, 4.9)	2.74 (1.21, 6.21)
CALINE3	25	5.6	1.1	4.4 (4.1, 4.8)	4.6 (4.3, 4.8)	.43 (.19, .97)
PAL	25	5.6	2.4	3.1 (1.8, 4.4)	4.2 (3.1, 4.6)	.03 (.01, .06)
HIWAY2	25	5.6	1.2	4.3 (4.0, 4.7)	4.5 (4.2, 4.6)	.71 (.31, 1.61)

* LESSER OF 25 OR 25% OF TOTAL EVENTS
** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

One-Hour

A summary of high by event results for the 1-hour averaging period is given in Table 5-3. This table is divided into two parts which present results for paired (part one) and unpaired (part two) performance comparisons. The number of events, average observed value, and average difference are listed in the first three columns of the paired part of the table. The average differences are also shown graphically in Figure 5-2. In general, all models perform better using the SF_6 tracer data than they do using the CO data, indicating problems either with quantifying CO emissions or background concentrations. There is no clear tendency for one model to perform better than another, although the PAL model overpredicted significantly for the at-grade CO data sets. All four models significantly underpredicted for the cut-section data set.

A second measure of bias, the fraction of events with the highest observed concentration greater than the highest predicted concentration, is presented in column four of Table 5-3. The residual is defined as an observed minus predicted value. Both GMLINE and CALINE3 underpredict the highest concentrations per event at least half of the time for all of the at-grade data bases, while both PAL and HIWAY2 overpredict the highest concentrations per event at least half of the time for all the at-grade data bases except GM75. Each of the four models underpredict the highest concentrations for virtually all events of the cut-section (CAL74) data base.

The next three columns in Table 5-3 present performance measures estimating scatter, and are titled characteristic discrepancies. They include the standard deviation of residuals (noise) with 95 percent confidence limits calculated from a Chi-Square test, the root mean square error, and the average absolute difference. Results for the at-grade data bases show that GMLINE nearly always has the smallest values (best performance) in all three

TABLE 5-3 (PART 1)
COMPARISON OF HIGHEST OBSERVED AND PREDICTED
ONE HOUR CONCENTRATION VALUES, EVENT BY EVENT
(PAIRED IN TIME)

DATA SET AND MODEL	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS			CHARACTERISTIC DISCREPANCIES		
		AVERAGE OBSERVED VALUE	AVERAGE DIFFERENCE** (CO - CP)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE** (SD)	ROOT MEAN SQUARE ERROR	AVERAGE ABSOLUTE DIFFERENCE	CORRELATION COEFFICIENT
1. GM75 - SF6 (PPB)								
GMLINE	62	2.5	.3 (.1, .5)	.81	.5 (.4, .6)	.6	.5	.77
CALINE3	62	2.5	-.1 (-.8, .6)	.73	2.5 (2.1, 3.1)	2.5	1.0	.53
PAL	62	2.5	-.2 (-.9, .5)	.65	1.4 (1.2, 1.7)	1.4	1.0	.70
HIWAY2	62	2.5	.2 (.1, .4)	.76	.5 (.5, .6)	.6	.5	.78
2. NYS76 - SF6 (PPB)								
GMLINE	21	5.6	.5 (.1, .9)	.67	1.2 (1.0, 1.8)	1.3	1.0	.91
CALINE3	21	5.6	.5 (-.4, 1.4)	.62	1.7 (1.3, 2.4)	1.7	1.4	.84
PAL	21	5.6	-.5 (-1.6, .6)	.43	2.3 (1.8, 3.4)	2.3	1.6	.77
HIWAY2	21	5.6	-.6 (-1.4, .3)	.43	1.8 (1.4, 2.6)	1.9	1.5	.87
3. SRI75 - CO (PPM)								
GMLINE	45	3.8	-.4 (-1.9, 1.1)	.51	2.5 (2.1, 3.2)	2.5	1.9	.53
CALINE3	45	3.8	.9 (-.6, 2.3)	.67	2.4 (2.0, 3.0)	2.5	2.0	.55
PAL	45	3.8	-2.8 (-5.6, -.1)	.38	6.1 (5.1, 7.8)	6.7	3.8	.43
HIWAY2	45	3.8	-1.3 (-2.8, .3)	.44	3.2 (2.7, 4.1)	3.4	2.4	.49
4. NYS77 - CO (PPM)								
GMLINE	301	2.1	-.2 (-.5, .0)	.52	1.5 (1.4, 1.6)	1.5	1.0	.55
CALINE3	301	2.1	-1.4 (-2.4, -.4)	.50	4.6 (4.3, 5.0)	4.8	2.2	.30
PAL	303	2.1	-4.4 (-7.2,-1.6)	.33	13.8 (12.8,15.0)	14.5	4.9	.16
HIWAY2	301	2.1	-1.3 (-1.9, -.7)	.41	3.8 (3.5, 4.1)	4.0	1.9	.33
5. CAL74 - CO (PPM)								
GMLINE	795	4.8	4.3 (4.1, 4.5)	1.00	1.8 (1.7, 1.9)	4.7	4.3	.25
CALINE3	795	4.8	4.2 (4.0, 4.5)	.99	1.9 (1.8, 2.0)	4.6	4.3	.12
PAL	795	4.8	3.8 (3.3, 4.2)	.96	3.2 (3.0, 3.3)	4.9	4.3	.02
HIWAY2	795	4.8	4.1 (3.9, 4.3)	1.00	1.8 (1.7, 1.9)	4.5	4.1	.16

* GM75 DATA ARE HALF-HOUR AVERAGES
** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

TABLE 5-3 (PART 2)
COMPARISON OF HIGHEST OBSERVED AND PREDICTED
ONE HOUR CONCENTRATION VALUES, EVENT BY EVENT
(PAIRED IN TIME)

DATA SET AND MODEL	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE	PERFORMANCE MEASURES - UNPAIRED COMPARISONS	
			VARIANCE COMPARISON**	FREQUENCY DISTRIBUTION COMPARISON** (MAXIMUM FRACTION)
1. GM75 - SF6 (PPB)				
GMLINE	62	2.5	.73 (.44, 1.21)	-.32 (.244)
CALINE3	62	2.5	.05 (.03, .09)	-.39 (.244)
PAL	62	2.5	.13 (.08, .22)	-.37 (.244)
HIWAY2	62	2.5	.60 (.36, .99)	-.29 (.244)
2. NYS76 - SF6 (PPB)				
GMLINE	21	5.6	.64 (.26, 1.58)	-.24 (.420)
CALINE3	21	5.6	.59 (.24, 1.44)	-.29 (.420)
PAL	21	5.6	.42 (.17, 1.04)	-.19 (.420)
HIWAY2	21	5.6	.45 (.18, 1.12)	-.19 (.420)
3. SRI75 - CO (PPM)				
GMLINE	45	3.8	1.41 (.77, 2.56)	.20 (.287)
CALINE3	45	3.8	2.11 (1.16, 3.84)	-.24 (.287)
PAL	45	3.8	.17 (.09, .31)	.27 (.287)
HIWAY2	45	3.8	.65 (.36, 1.19)	.24 (.287)
4. NYS77 - CO (PPM)				
GMLINE	301	2.1	.39 (.31, .49)	-.12 (.111)
CALINE3	301	2.1	.05 (.04, .07)	.17 (.111)
PAL	303	2.1	.01 (.01, .01)	.28 (.110)
HIWAY2	301	2.1	.08 (.06, .10)	.21 (.111)
5. CAL74 - CO (PPM)				
GMLINE	795	4.8	33.86 (29.46,38.92)	-.98 (.068)
CALINE3	795	4.8	7.84 (6.82, 9.02)	-.95 (.068)
PAL	795	4.8	.50 (.43, .57)	-.90 (.068)
HIWAY2	795	4.8	12.04 (10.47,13.83)	-.94 (.068)

* GM75 DATA ARE HALF-HOUR AVERAGES
** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

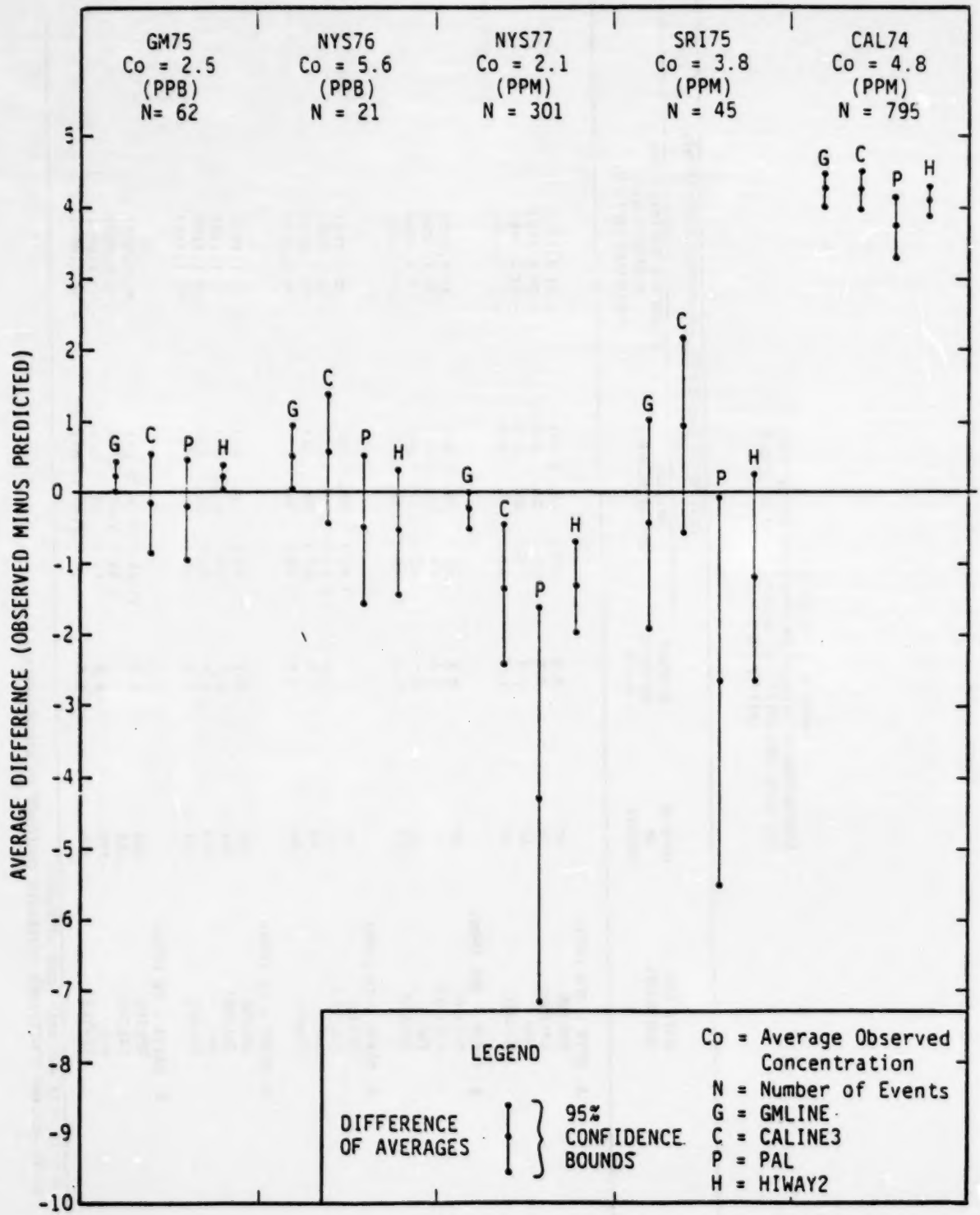

Figure 5-2. Average difference of highest observed and predicted one hour concentrations (event by event).

categories. In general, the PAL model performs worst for this measure. For the cut-section data base, PAL produces the largest standard deviations, with little difference between the models for the other measures of scatter.

The last column of the first part of Table 5-3 lists the Pearson correlation of observed and predicted concentration pairs for the highest by event data sets. Results show that GMLINE generally produces the highest correlation coefficients for the at-grade data sets, ranging from .53 to .91; while PAL produces the lowest correlations from .16 to .77. HIWAY-2 and GMLINE produce similar correlations for the tracer data sets. All the models exhibit poor correlation (.25 or less) for the cut-section data base.

The second page of Table 5-3 (Part 2) summarizes unpaired performance measures for the highest per event one-hour concentration values. The first two columns of Part 2 repeat the number of events and average observed value for each data set. The ratio of observed to predicted variances, along with 95 percent confidence bounds determined by an F test, are presented in column three. Variance ratios close to 1.0 indicate good model performance. Results show the GMLINE model performs best using this performance statistic for each of the at-grade data sets. For the cut-section data set (CAL74), predicted variances are small relative to observed, except for PAL which continues to predict with a larger variance than observed.

A comparison of observed and predicted frequency distributions is provided in the last column of Table 5-3. The value listed for each data set and model represents the largest fractional difference between the observed and predicted distribution functions when compared at the same concentration value. For this measure, positive fractional difference implies model overprediction. The value given in parentheses is the maximum absolute difference which is significantly different from zero, at a 95 percent confidence level, as given by the Kolmogorov-Smirnov (K-S) test. Results for the two at-grade tracer data sets show all models underpredicting the highest

concentrations by event, with none of the distributions significantly different from observed for the NYS76 data set. For the two at-grade CO data sets, the models generally overpredict, with no distributions significantly different from observed for the SRI75 data set. The frequency distribution comparison for the cut-section data base shows virtually no overlap between distributions of the high by event data sets for any of the models.

Eight-Hour

A summary of high by event results for the eight-hour averaging period is given in the top half of Table 5-4. The comparison of "all concentrations" is discussed in the next section. This table is also divided into two parts which present results for paired (part 1) and unpaired (part 2) performance comparisons. Statistics were only generated for the two largest data bases.

Paired results for the at-grade data set (NYS77) show that GMLINE outperforms the other models for each of the measures. GMLINE is the only model which does not predict highest concentrations by event that are significantly different from observed. It also produces the lowest values for all three measures of characteristic discrepancies and the highest correlation coefficient. All models perform poorly for the cut-section data base (CAL74), substantially underpredicting concentrations and producing extremely small correlation coefficients.

Similar results were obtained for the unpaired analysis of high by event eight-hour concentrations (Part 2 of Table 5-4). GMLINE performs best for the at-grade data base, producing the most favorable values for both the variance comparison and the frequency distribution comparison. For these measures all models perform poorly with the cut-section data base.

TABLE 5-4 (PART 1)
COMPARISON OF HIGHEST OBSERVED AND PREDICTED EIGHT HOUR CONCENTRATION VALUES, EVENT BY EVENT
(PAIRED IN TIME)

DATA SET	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE OBSERVED VALUE	BIAS: AVERAGE DIFFERENCE* (CO - CP)	BIAS: FRACTION OF POSITIVE (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE	CORRELATION COEFFICIENT
A. HIGHEST CONCENTRATION, EVENT BY EVENT (PAIRED IN TIME)								
1. NYS77 - CO (PPM)								
GMLINE	28	2.1	-.1 (-.4, .2)	.54	1.0 (.8, 1.3)	1.0	.8	.54
CALINE3	28	2.1	-.9 (-1.7, -.1)	.46	2.2 (1.7, 3.0)	2.3	1.5	.33
PAL	28	2.1	-3.4 (-5.9, -.9)	.25	6.6 (5.2, 9.0)	7.3	3.7	.14
HIWAY2	28	2.1	-1.2 (-2.1, -.3)	.36	2.5 (2.0, 3.4)	2.8	1.7	.34
2. CAL74 - CO (PPM)								
GMLINE	112	4.6	4.1 (3.9, 4.3)	1.00	.8 (.7, .9)	4.2	4.1	.04
CALINE3	112	4.6	4.0 (3.7, 4.3)	.99	1.0 (.9, 1.1)	4.1	4.0	-.08
PAL	112	4.6	3.6 (3.0, 4.3)	.97	1.9 (1.7, 2.2)	4.1	3.9	-.06
HIWAY2	112	4.6	3.9 (3.7, 4.2)	1.00	.9 (.8, 1.0)	4.0	3.9	.01
B. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION)								
1. NYS77 - CO (PPM)								
GMLINE	84	.9	-.1 (-.2, .1)	.64	.7 (.6, .8)	.7	.5	.80
CALINE3	84	.9	-.7 (-1.0, -.3)	.45	1.6 (1.4, 1.9)	1.7	1.0	.61
PAL	84	.9	-2.4 (-3.6,-1.2)	.46	5.6 (4.8, 6.6)	6.0	2.6	.37
HIWAY2	84	.9	-.8 (-1.2, -.3)	.48	1.9 (1.6, 2.2)	2.0	1.0	.63
2. CAL74 - CO (PPM)								
GMLINE	672	1.8	1.7 (1.3, 2.0)	.88	1.5 (1.4, 1.6)	2.2	1.7	.31
CALINE3	672	1.8	1.6 (1.3, 1.9)	.89	1.5 (1.4, 1.6)	2.2	1.6	.37
PAL	672	1.8	1.5 (1.2, 1.7)	.83	1.7 (1.6, 1.8)	2.2	1.6	.13
HIWAY2	672	1.8	1.6 (1.3, 1.9)	.85	1.5 (1.4, 1.6)	2.2	1.6	.34

* 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

TABLE 5-4 (PART 2)
COMPARISON OF HIGHEST OBSERVED AND PREDICTED EIGHT HOUR CONCENTRATION VALUES, EVENT BY EVENT
(PAIRED IN TIME)

DATA SET AND MODEL	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE	PERFORMANCE MEASURES - UNPAIRED COMPARISONS	
			VARIANCE COMPARISON*	FREQUENCY DISTRIBUTION COMPARISON* (MAXIMUM FRACTION)
A. HIGHEST CONCENTRATION (EVENT BY EVENT)				
1. NYS77 - CO (PPM)				
GMLINE	28	2.1	.36 (.16, .77)	-.25 (.363)
CALINE3	28	2.1	.09 (.04, .20)	.29 (.363)
PAL	28	2.1	.01 (.01, .02)	.39 (.363)
HIWAY2	28	2.1	.07 (.03, .15)	.29 (.363)
2. CAL74 - CO (PPM)				
GMLINE	112	4.6	6.51 (4.48, 9.46)	-1.00 (.182)
CALINE3	112	4.6	2.89 (1.99, 4.21)	-.99 (.182)
PAL	112	4.6	.23 (.16, .34)	-.93 (.182)
HIWAY2	112	4.6	3.63 (2.49, 5.27)	-.98 (.182)
B. ALL CONCENTRATIONS, ALL STATIONS (PAIRED IN TIME AND LOCATION)				
1. NYS77 - CO (PPM)				
GMLINE	84	.9	.66 (.43, 1.02)	-.18 (.210)
CALINE3	84	.9	.23 (.15, .36)	.14 (.210)
PAL	84	.9	.03 (.02, .04)	.29 (.210)
HIWAY2	84	.9	.18 (.11, .27)	.18 (.210)
2. CAL74 - CO (PPM)				
GMLINE	672	1.8	24.27 (20.86,28.24)	-.70 (.074)
CALINE3	672	1.8	23.32 (20.04,27.13)	-.68 (.074)
PAL	672	1.8	2.87 (2.46, 3.34)	-.63 (.074)
HIWAY2	672	1.8	24.27 (20.86,28.24)	-.65 (.074)

* 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

5.3 Statistics for All Concentrations Paired in Time and Space

One-Hour

The largest data sets considered in this evaluation represent all concentration values paired in time and location. One-hour statistics are summarized in Table 5-5 for both paired (part one) and unpaired (part two) performance comparisons. Statistics are presented in the same columns described for the high by event analysis. Figure 5-3 presents graphically the average difference of all observed and predicted one-hour concentrations.

Results for the one-hour analysis of all paired at-grade data differed for the SF_6 and CO data sets. HIWAY2 outperformed the other models using the tracer data bases, producing the lowest values of bias and characteristic discrepancies and the highest correlation coefficients. GMLINE performed better overall for the two CO at-grade sets, although CALINE3 performed comparably with the SRI75 data. Once again, all models underpredicted significantly and with little correlation for the cut-section data base (CAL74).

The unpaired comparisons are shown in Part 2 of Table 5-5 for the one-hour analysis of all data paired in time and space. For the variance comparison, GMLINE predicted with essentially the same amount of scatter as was observed for three of the at-grade data sets, while PAL consistently predicted with less scatter than was observed. The observed and predicted cumulative distribution functions are significantly different (at the 95% confidence level) for all models and data sets except PAL with GM75 and CALINE3 with NYS76.

Results for the cut-section data base were generally poor for all models. PAL did produce the lowest variance comparison, but its predicted variance was significantly less than observed.

TABLE 5-5 (PART 1)
COMPARISON OF ALL OBSERVED AND
PREDICTED ONE HOUR CONCENTRATION VALUES
(PAIRED IN TIME AND SPACE)

DATA SET AND MODEL	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS						
		BIAS			CHARACTERISTIC DISCREPANCIES			
		AVERAGE OBSERVED VALUE	AVERAGE DIFFERENCE** (CO - CP)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE** (SD)	ROOT MEAN SQUARE ERROR	AVERAGE ABSOLUTE DIFFERENCE	CORRELATION COEFFICIENT
1. GM75 - SF6 (PPB)								
GMLINE	433	.9	.2 (.1, .3)	.80	.5 (.5, .5)	.5	.3	.84
CALINE3	433	.9	-.3 (-.5, -.1)	.58	1.6 (1.5, 1.8)	1.7	.7	.41
PAL	433	.9	-.3 (-.5, -.2)	.49	1.0 (1.0, 1.1)	1.1	.6	.70
HIWAY2	433	.9	.0 (-.1, .0)	.55	.5 (.4, .5)	.5	.3	.87
2. NY576 - SF6 (PPB)								
GMLINE	150	2.1	.5 (.3, .6)	.80	1.2 (1.1, 1.3)	1.3	.7	.87
CALINE3	150	2.1	.3 (.1, .5)	.71	1.3 (1.1, 1.4)	1.3	.8	.85
PAL	150	2.1	-.2 (-.5, .0)	.63	1.5 (1.4, 1.7)	1.5	1.0	.85
HIWAY2	150	2.1	.0 (-.2, .2)	.67	1.2 (1.1, 1.4)	1.2	.8	.90
3. SRI75 - CO (PPM)								
GMLINE	484	1.8	-.2 (-.4, .0)	.52	1.6 (1.5, 1.8)	1.7	1.1	.58
CALINE3	491	1.8	.3 (.1, .6)	.64	1.4 (1.3, 1.5)	1.5	1.1	.60
PAL	506	1.8	-2.1 (-2.6,-1.7)	.28	4.5 (4.2, 4.8)	4.9	2.7	.32
HIWAY2	494	1.8	-.9 (-1.2, -.7)	.39	2.4 (2.2, 2.5)	2.5	1.6	.50
4. NY577 - CO (PPM)								
GMLINE	521	1.6	-.2 (-.4, .1)	.49	1.6 (1.5, 1.7)	1.6	1.1	.36
CALINE3	549	1.5	-1.4 (-1.9, -.8)	.42	4.0 (3.8, 4.3)	4.2	2.0	.14
PAL	554	1.5	-4.1 (-5.5,-2.7)	.29	12.2 (11.5,12.9)	12.8	4.6	.02
HIWAY2	548	1.5	-1.3 (-1.7, -.9)	.37	3.5 (3.3, 3.7)	3.7	1.9	.21
5. CAL74 - CO (PPM)								
GMLINE	3370	2.5	2.4 (2.2, 2.5)	.99	1.8 (1.7, 1.8)	2.9	2.4	.27
CALINE3	3401	2.5	2.2 (2.1, 2.4)	.97	1.8 (1.7, 1.8)	2.9	2.3	.21
PAL	3480	2.5	2.0 (1.8, 2.1)	.93	2.4 (2.3, 2.4)	3.1	2.3	.03
HIWAY2	3439	2.5	2.2 (2.1, 2.3)	.96	1.8 (1.7, 1.8)	2.8	2.2	.24

* GM75 DATA ARE HALF-HOUR AVERAGES
** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

TABLE 5-5 (PART 2)
COMPARISON OF ALL OBSERVED AND
PREDICTED ONE HOUR CONCENTRATION VALUES
(PAIRED IN TIME AND SPACE)

DATA SET AND MODEL	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE	PERFORMANCE MEASURES - UNPAIRED COMPARISONS	
			VARIANCE COMPARISON**	FREQUENCY DISTRIBUTION COMPARISON** (MAXIMUM FRACTION)
1. GM75 - SF6 (PPB)				
GMLINE	433	.9	1.15 (.95, 1.39)	-.28 (.092)
CALINE3	433	.9	.25 (.21, .30)	.11 (.092)
PAL	433	.9	.40 (.33, .48)	-.09 (.092)
HIWAY2	433	.9	.94 (.78, 1.13)	-.11 (.092)
2. NYS76 - SF6 (PPB)				
GMLINE	150	2.1	1.02 (.74, 1.41)	-.33 (.157)
CALINE3	150	2.1	.92 (.67, 1.27)	-.12 (.157)
PAL	150	2.1	.63 (.46, .88)	-.19 (.157)
HIWAY2	150	2.1	.67 (.49, .92)	-.20 (.157)
3. SRI75 - CO (PPM)				
GMLINE	484	1.8	.94 (.78, 1.12)	.13 (.087)
CALINE3	491	1.8	1.77 (1.48, 2.11)	-.12 (.087)
PAL	506	1.8	.14 (.12, .16)	.28 (.086)
HIWAY2	494	1.8	.43 (.36, .51)	.20 (.087)
4. NYS77 - CO (PPM)				
GMLINE	521	1.6	.48 (.41, .57)	-.10 (.084)
CALINE3	549	1.5	.09 (.07, .10)	.16 (.082)
PAL	554	1.5	.01 (.01, .01)	.36 (.082)
HIWAY2	548	1.5	.11 (.09, .13)	.23 (.082)
5. CAL74 - CO (PPM)				
GMLINE	3370	2.5	32.97 (30.82,35.28)	-.91 (.033)
CALINE3	3401	2.5	15.90 (14.87,17.01)	-.86 (.033)
PAL	3480	2.5	1.35 (1.27, 1.45)	-.79 (.033)
HIWAY2	3439	2.5	19.75 (18.47,21.12)	-.82 (.033)

* GM75 DATA ARE HALF-HOUR AVERAGES
** 95 PERCENT CONFIDENCE INTERVALS ENCLOSED IN PARENTHESES

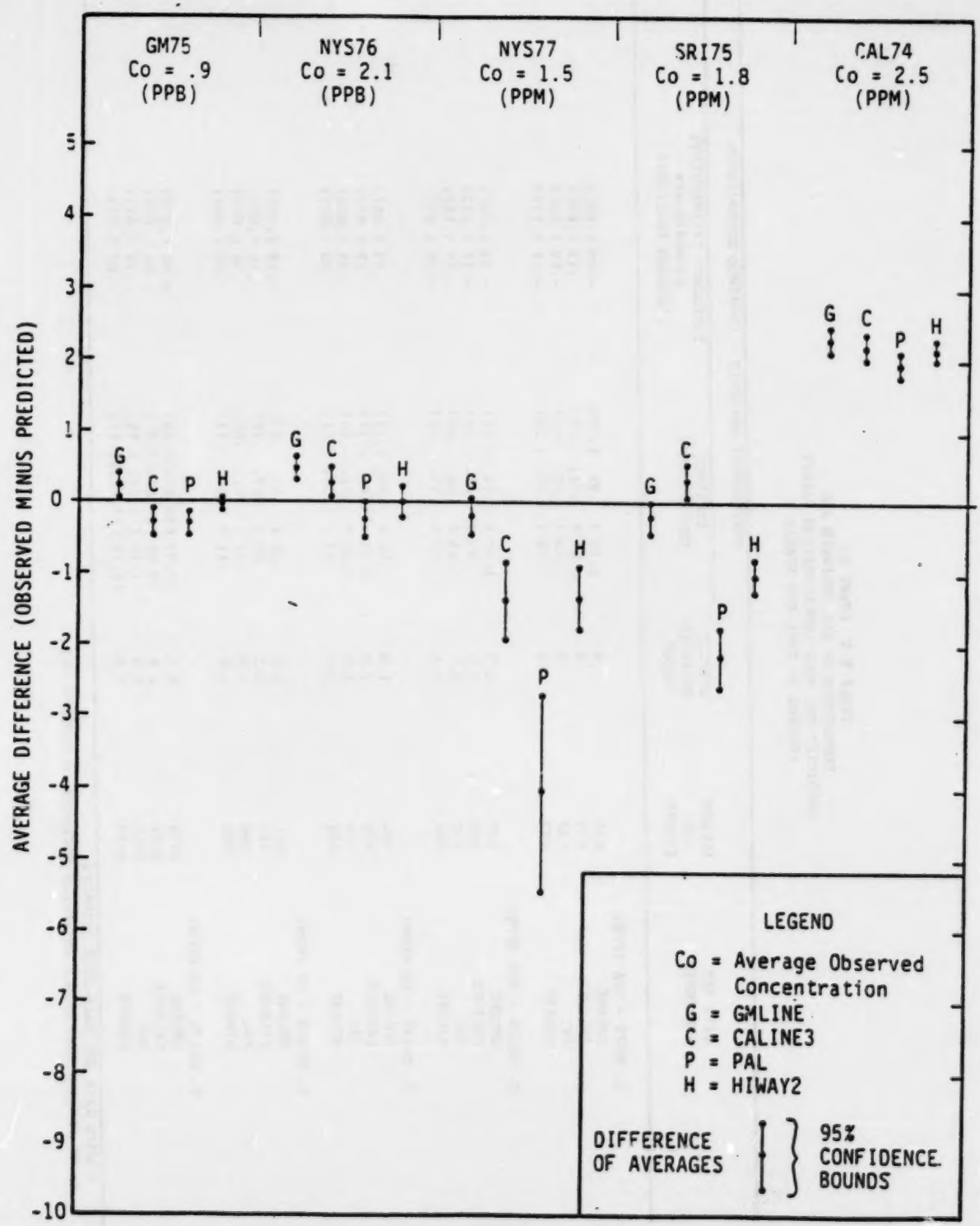

Figure 5-3. Average difference of all observed and predicted one hour concentrations (paired in time and space).

Eight-Hour

Summary statistics for the "all paired" analysis of eight-hour data are given in the bottom half of Table 5-4 (part 1). Results for the at-grade data set (NYS77) show that GMLINE produced the lowest bias and scatter and the highest correlation of observed to predicted values. CALINE3 and HIWAY-2 perform comparably, while PAL produced the largest bias and scatter and lowest correlation. All models perform equally for the cut-section data set (CAL74), except the correlation by PAL is somewhat lower.

As shown in Part 2 of Table 5-4, the variance comparison for the "all concentration" data sets indicates opposite performance between the at-grade and cut-section data bases. The ratio of variances were significantly different from unity at a 95% confidence level for all models and both data sets (except GMLINE for NYS77). Also for NYS77, all models except PAL produced frequency distributions which were similar to the observed at a 95% level of confidence. The cut-section data base resulted in significantly less predicted scatter than observed for all models, but to a lesser degree for PAL.

5.4 Statistics for Highest Concentration at Each Station

One-Hour

Performance statistics are presented in Table 5-6 for the comparison of highest and second highest one-hour concentrations observed and predicted at each station over the duration of each of the five monitoring programs. Because of the small number of events (i.e., number of monitoring stations) for most of the data bases, caution should be exercised when interpreting the statistics.

The statistics provided in this table compare observed and predicted one-hour values for the number of data pairs shown in the first column. This number ranges from 3 for the NYS77-CO study to 22 for the SRI75-CO program.

TABLE 5-6
COMPARISON OF HIGHEST AND SECOND HIGHEST OBSERVED AND PREDICTED ONE HOUR CONCENTRATION VALUES*
(PAIRED BY STATION)

DATA SET AND MODEL	STNS	PERFORMANCE MEASURES OF HIGHEST CONCENTRATIONS			PERFORMANCE MEASURES OF SECOND HIGHEST CONCENTRATIONS		
			BIAS	CHARACTERISTIC DISCREPANCIES		BIAS	CHARACTERISTIC DISCREPANCIES
		AVERAGE OBSERVED VALUE (CO)	AVERAGE DIFFERENCE (CO - CP)	NOISE (SD)	AVERAGE OBSERVED VALUE (CO)	AVERAGE DIFFERENCE (CO - CP)	NOISE (SD)
1. GM75 - SF6 (PPB)	7						
GMLINE		2.3	.2	.6	2.0	.1	.3
CALINE3		2.3	-9.1	5.8	2.0	-2.0	1.0
PAL		2.3	-2.8	.8	2.0	-2.5	1.1
HIWAY2		2.3	-.5	.9	2.0	-.5	.6
2. NYS76 - SF6 (PPB)	8						
GMLINE		6.9	.7	2.7	4.6	-.5	1.1
CALINE3		6.9	-1.0	4.4	4.6	-.1	.9
PAL		6.9	-1.4	3.7	4.6	-1.8	.7
HIWAY2		6.9	-2.1	3.5	4.6	-1.3	1.2
3. SRI75 - CO (PPM)	22						
GMLINE		5.5	-.5	1.9	4.4	-.6	1.2
CALINE3		5.5	.7	2.0	4.4	.8	1.9
PAL		5.5	-16.5	5.9	4.4	-7.5	2.7
HIWAY2		5.5	-5.0	2.5	4.4	-3.4	2.8
4. NYS77 - CO (PPM)	3						
GMLINE		5.5	-3.0	2.7	5.2	-2.4	2.0
CALINE3		5.5	-22.4	5.9	5.2	-13.6	5.8
PAL		5.5	-121.1	17.5	5.2	-44.0	6.2
HIWAY2		5.5	-29.8	4.5	5.2	-9.4	1.5
5. CAL74 - CO (PPM)	6						
GMLINE		10.9	9.8	3.6	9.6	8.6	2.9
CALINE3		10.9	6.4	4.6	9.6	7.8	3.2
PAL		10.9	-8.2	12.9	9.6	-4.2	7.3
HIWAY2		10.9	8.3	3.4	9.6	7.3	2.7

* GM75 DATA ARE HALF-HOUR AVERAGES

The next two columns present the average of the observed concentrations and the average difference between observed and predicted values. Results show that GMLINE produces the smallest bias of highest concentrations by station for each at-grade data set. The model also produces the smallest bias of second highest concentractions by station for three of the four at-grade data bases. PAL overpredicts by an extreme margin for the NYS77 data base. For the cut-section data set 3 of the 4 models underpredict, while PAL overpredicts.

GMLINE performs with the lowest noise (or standard deviations of the residuals) for the at-grade high by station concentrations. GMLINE also produces the lowest noise for three of the four at-grade data sets when second highest concentrations are compared. The largest values of noise are found with the PAL model for NYS77 and CAL74.

As can be seen from the results presented here, the high by station statistics are very unstable, with large differences between the high and second high data sets.

Eight-Hour

Results of the eight-hour high and second high by station analyses are presented in Table 5-7. All of the models overpredicted for NYS77, with GMLINE showing the least bias and PAL the greatest. Underprediction was the rule with CAL74 data, except for the PAL results for high by station which overpredicted. The lowest values of noise are found for GMLINE with NYS77. This statistic is unstable, however, as evidenced by PAL for CAL74, which exhibits the largest noise for the high concentrations and the smallest noise for the second high concentrations. Again, caution should be exercised when analyzing the confidence intervals for these small data sets, since many of the assumptions are not met.

TABLE 5-7
COMPARISON OF HIGHEST AND SECOND HIGHEST OBSERVED
AND PREDICTED EIGHT HOUR CONCENTRATION VALUES
(PAIRED BY STATION)

DATA SET AND MODEL	STNS	PERFORMANCE MEASURES OF HIGHEST CONCENTRATIONS			PERFORMANCE MEASURES OF SECOND HIGHEST CONCENTRATIONS		
			BIAS	CHARACTERISTIC DISCREPANCIES		BIAS	CHARACTERISTIC DISCREPANCIES
		AVERAGE OBSERVED VALUE (CO)	AVERAGE DIFFERENCE (CO - CP)	NOISE (SD)	AVERAGE OBSERVED VALUE (CO)	AVERAGE DIFFERENCE (CO - CP)	NOISE (SD)
1. HYS77 - CO (PPM)	3						
GMLINE		2.9	-1.1	.6	2.3	-1.0	.4
CALINE3		2.9	-4.3	2.1	2.3	-3.6	1.3
PAL		2.9	-22.5	3.3	2.3	-15.4	7.3
HIWAY2		2.9	-7.4	1.3	2.3	-3.2	1.5
2. CAL74 - CO (PPM)	6						
GMLINE		4.2	3.5	1.5	3.8	3.3	1.7
CALINE3		4.2	2.4	1.3	3.8	2.9	1.3
PAL		4.2	-2.4	4.4	3.8	.5	.9
HIWAY2		4.2	2.6	1.3	3.8	2.6	1.4

5.5 Examples of Statistics by Subsets

While the model performance statistics presented earlier are informative for comparing model performance for applications in regulatory settings, the results do not provide much information as to why individual models are performing good or badly. A better understanding of model performance can be obtained by analyzing results for different subsets of the basic data base. In this section examples of the subset results are presented for two of the data bases, GM75 and NYS77. The General Motors data base was selected because it probably contains the best quality data. Since it was a tracer (SF_6) study, there is no contamination of ambient air quality data by background or other nearby sources. As shown in the previous results sections, the models perform best for the GM data base. The 1977 New York State (Long Island Expressway) CO data base was selected because it is typical of highway modeling applications and it produced distinct differences between overall model performances. The NYS77 data base also contains a large number of events (over 300) for statistical analysis.

Results by subset are presented for "N" highest and paired in time and space data sets only.

"N" Highest Observed and Predicted Values

In Table 5-8 the difference of averages are presented for the "N" highest observed and predicted SF_6 concentrations for the GM75 data base. In this table the first column of data contains the average observed value for all stations combined, by station and by subsets of meteorological conditions.

The difference of averages for GMLINE shows little bias for any of the subsets. However, the largest underprediction (positive value) occurs near the roadway at Station 3 (see Section 3 figures), and for higher wind speeds, unstable conditions and near parallel wind/road angles. It should be noted

TABLE 5-8

COMPARISON OF DIFFERENCE OF AVERAGES FOR "N" HIGHEST OBSERVED AND PREDICTED SF_6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION) FOR VARIOUS SUBSETS
DATA BASE: GM75 AVERAGING TIME: HALF HOUR

Data Sets ("N" of Events) Lesser of 25 or 25%	Average Observed Value (C_o) (PPB)	Difference of Averages (C_o-C_p) Model			
		GMLINE	CALINE3	PAL	HIWAY2
1. All Stations/All Events(16)	3.4	.1	-1.9	-1.9	-.1
2. By Station/All Events					
Station 1(16)	.9	-.1	-2.2	-.6	-.7
Station 2(16)	2.8	.1	-.7	-.7	-.1
Station 3(16)	3.1	.4	-.8	-1.7	.1
Station 4(16)	1.9	.2	-1.0	-2.0	-.4
Station 5(16)	1.2	.1	-1.2	-1.8	-.5
Station 6(16)	.9	.0	-1.3	-1.5	-.4
Station 7(16)	.5	.0	-1.4	-1.0	-.3
3. By Meteorology					
A. Wind Speed					
< 2.0 sec (7)	3.4	-.2	-3.3	-1.0	-.4
2.0 to 4.0 (9)	3.3	.2	-.5	-2.6	.3
> 4.0 sec (0)	-	-	-	-	-
B. Stability Group					
Class UNST (7)	2.9	.2	.4	-.1	.4
Class NEUT (2)	2.9	-.2	-9.2	-1.6	-.5
Class STAB (7)	3.7	.1	-.9	-3.0	.0
C. Wind/Road Angle					
<20. Degrees (6)	3.7	.2	-3.9	-3.5	.1
20. to 60. (6)	3.3	.0	-.3	-.3	-.1
>60. Degrees (5)	2.9	.1	-.4	.6	.0

that the GM75 data base contains no averaging periods with wind speed greater than 4.0 m/s and only eight periods of neutral stability (i.e., N = 2). Therefore the statistics for some of the subsets are fairly unstable and the results should be viewed with this in mind.

The CALINE3 and PAL models in general overpredict the "N" highest values by a much greater extent than GMLINE underpredicts (or HIWAY-2 overpredicts). These overpredictions by CALINE3 and PAL seem to occur under different circumstances for the two models. The largest overpredictions by CALINE3 occur for light wind speeds, neutral stabilities and low wind/road angles, while PAL overpredicts more for higher wind speeds, stable conditions and low wind/road angles.

HIWAY-2 shows a small amount of negative bias (overprediction) overall, with little distinction between the subsets by station or meteorology.

Table 5-9 shows similar results for the NYS77 data base. This data base shows more distinct differences between the models than GM75. GMLINE overpredicts to a lesser degree than the other three models. Only minor difference exist between stations for all the models. The largest GMLINE overpredictions are for light wind speeds, neutral stabilities and near parallel wind/road angles, while underpredictions occur for higher wind speeds. In fact, this same tendency is found for all four models, with the largest overpredictions by PAL.

Observed and Predicted Values Paired in Space and Time

Table 5-10 presents model performance statistics (difference of averages) for subsets of events paired in space and time for the GM75 data base. The same subsets are shown in the previous section for "N" highest values. The number of events is much larger for each of the paired subsets, while the average observed and predicted values are somewhat lower since the full set of

TABLE 5-9

COMPARISON OF DIFFERENCE OF AVERAGES FOR "N" HIGHEST OBSERVED AND PREDICTED CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION) FOR VARIOUS SUBSETS
DATA BASE: NYS77-CO AVERAGING TIME: 1 HOUR

Data Sets ("N" of Events) Lesser of 25 or 25%	Average Observed Value (C_o) (ppm)	Difference of Averages (C_o-C_p) Model			
		GMLINE	CALINE3	PAL	HIWAY2
1. All Stations/All Events(25)	4.7	-2.4	-12.5	-37.3	-8.7
2. By Station/All Events					
Station 1(25)	2.2	-.6	-4.5	-19.2	-5.0
Station 2(25)	4.2	-1.6	-8.0	-25.1	-5.8
Station 3(25)	3.9	-1.3	-8.7	-22.7	-5.7
3. By Meteorology					
A. Wind Speed					
< 2.0 sec (25)	3.9	-2.8	-13.4	-38.1	-9.5
2.0 to 4.0 (25)	3.8	-.2	-.3	-1.9	-.7
> 4.0 sec (14)	3.8	1.3	1.4	.6	1.1
B. Stability Group					
Class UNST (11)	3.6	.4	-2.9	-6.4	-1.5
Class NEUT (25)	4.6	-2.5	-11.2	-31.0	-8.4
Class STAB (14)	2.0	-1.0	-5.7	-17.3	-3.4
C. Wind/Road Angle					
<20. Degrees (15)	4.0	-2.8	-14.5	-38.4	-6.4
20. to 60. (25)	3.8	-.4	-4.5	-14.6	-2.3
>60. Degrees (25)	3.8	-.5	-1.5	-5.9	-5.6

TABLE 5-10

COMPARISON OF DIFFERENCE OF AVERAGES FOR
OBSERVED AND PREDICTED SF_6 CONCENTRATION VALUES
PAIRED IN TIME AND SPACE FOR VARIOUS SUBSETS
DATA BASE: GM75 AVERAGING TIME: HALF HOUR

Data Sets	Number of Events	Average Observed Value (C_o) (PPB)	Difference of Averages (C_o-C_p) Model			
			GMLINE	CALINE3	PAL	HIWAY2
1. All Concentrations	433	.9	.2	-.3	-.3	.0
2. By Station						
Station 1	62	.3	.0	-.6	-.2	-.2
Station 2	62	1.4	.7	.1	.1	.3
Station 3	62	2.0	.4	.0	-.2	.2
Station 4	61	1.1	.2	-.2	-.6	-.1
Station 5	62	.7	.1	-.4	-.6	-.2
Station 6	62	.5	.0	-.4	-.5	-.2
Station 7	62	.3	.0	-.4	-.4	-.1
3. By Meteorology						
A. Wind Speed						
< 2.0 sec	189	.0	.2	-.8	-.2	-.1
2.0 to 4.0	244	.9	.2	.1	-.4	.0
> 4.0 sec	0	-	-	-	-	-
B. Stability Group						
Class UNST	203	.8	.2	.2	.0	.1
Class NEUT	41	.8	.1	-1.6	-.9	-.1
Class STAB	189	1.0	.2	-.5	-.7	-.2
C. Wind/Road Angle						
<20. Degrees	154	1.0	.3	-.6	-.9	-.2
20. to 60.	154	.9	.2	-.2	-.1	0
>60. Degrees	125	.8	.1	.0	.1	.0

values are included in this analysis. For the GMLINE model a slight underprediction occurs for the all-paired data set, but the analysis by station shows that underprediction at Stations 2 through 4 are primarily responsible for this. Very little difference exists between meteorological subsets for the GMLINE model. CALINE3 and PAL show nearly equivalent overprediction as indicated by the all-paired in time and space data set. CALINE3 shows more pronounced overprediction for light wind speed, neutral stability and near parallel wind/road angles, while PAL's largest overpredictions occur with both neutral and stable conditions and also for near parallel wind/road angles. The HIWAY-2 model shows no significant bias for any of the GM75 data sets shown.

Similar results for the NYS77 data base are displayed in Table 5-11. There were only three monitoring stations for this data base, but the number of events is somewhat larger than for GM75. All four models tend to overpredict for each station and meteorological subset, except for the highest wind speed (greater than 4 m/s). All four models underpredict for the higher wind speeds. GMLINE also shows some slight underprediction for unstable conditions.

Again, the tendency by all four models is to produce the largest overpredictions for light wind speeds and near parallel wind/road angles. Differences between the models, though, show GMLINE overpredicting the least and PAL overpredicting the most.

TABLE 5-11

COMPARISON OF DIFFERENCE OF AVERAGES FOR
OBSERVED AND PREDICTED CO CONCENTRATION VALUES
PAIRED IN TIME AND SPACE FOR VARIOUS SUBSETS
DATA BASE: NYS77 AVERAGING TIME: 1 HOUR

Data Sets	Number of Events	Average Observed Value (C_o) (PPB)	Difference of Averages (C_o-C_p) Model			
			GMLINE	CALINE3	PAL	HIWAY2
1. All Concentrations	521	1.6	-.2	-1.4	-4.1	-1.3
2. By Station						
Station 1	144	.9	-.5	-1.4	-4.7	-1.7
Station 2	197	2.0	.1	-1.3	-4.1	-1.2
Station 3	180	1.7	-.2	-1.4	-3.7	-1.1
3. By Meteorology						
A. Wind Speed						
< 2.0 sec	255	1.5	-.5	-2.8	-7.7	-2.4
2.0 to 4.0	194	1.7	.0	-.1	-.8	-.4
> 4.0 sec	72	1.8	.6	.7	.2	.5
B. Stability Group						
Class UNST	75	1.6	.3	-.7	-1.8	-.4
Class NEUT	355	1.8	-.2	-1.4	-4.3	-1.4
Class STAB	91	1.0	-.3	-1.6	-5.2	-1.4
C. Wind/Road Angle						
<20. Degrees	131	1.4	-.5	-3.3	-7.7	-1.9
20. to 60.	206	1.6	-.1	-.9	-3.7	-.8
>60. Degrees	184	1.7	.0	-.3	-1.7	-1.4

6.0 SUMMARY AND CONCLUSIONS

A systematic evaluation of model performance has been carried out for mobile source air quality models. The evaluation approach involves comparisons of observed concentrations and model predictions. Statistical measures recommended by the American Meteorological Society have been used to assess model performance. As with the previous evaluation studies for other model categories, the primary objective of the current project is to produce performance statistics so that EPA and a group of reviewers may judge the relative merits of different models.

No diagnostic analyses have been performed to better understand why individual models perform the way they do. Statistics were generated though, for subsets of events by station, wind speed, stability category, and wind/roadway angles. The volume of information provided in the appendix tables should provide a useful starting point for such diagnostic analysis.

Summary of Procedures

Data from five field studies were prepared for use in the evaluation of four mobile source models. The data bases and models are listed below:

Models	Data Bases
CALINE3	GM75 - General Motors (SF_6)
GMLINE	NYS76 - Long Island Expressway (SF_6)
HIWAY-2	SRI75 - SRI Highway 101 (CO)
PAL	NYS77 - Long Island Expressway (CO)
	CAL74 - Santa Monica Freeway (CO)

A summary of the data bases, models, and statistics to be generated was prepared as part of a test run package, which also included two-hour test runs for each model with each data base. This test run package was submitted to the respective model developers for review and comment. Responses to the

comments were then made, the models were run for the full data bases and statistics were generated.

Summary of Results

The results are presented in Section 5 and in the Appendix A through D tables. The most distinct results are highlighted in the following statements:

- Better model performance was found for the SF_6 tracer data bases than for the CO data sets.
- The models exhibit distinct differences in performance within any individual data set.
- Bias for the 1-hour and 8-hour averages showed similarities for each model.
- All of the models underpredicted significantly for the cut-section (Santa Monica) data set. It should be noted that neither the PAL or GMLINE models were designed to handle cut section roadways.
- The largest overpredictions occurred with the NYS77 (CO) data base, especially for the PAL model.
- As an overall assessment of the statistics generated, the GMLINE model performed best most often, while the PAL model ranked lowest most frequently. None of the models performed well with the cut-section data base.

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APPENDIX A

STATISTICS FOR HIGHEST "N" VALUES

In the high N tables, model performance statistics are presented which compare the highest "N" (lesser of 25 percent or the 25 highest) observed and predicted concentration values, unpaired in time or location. Each table contains the results for one model, one data base base and one averaging time (1 or 8 hours). In each table, results are presented for the entire data set (all stations/all events) and for subsets representing either a single monitoring station or particular meteorological conditions. Subsets based on meteorology were developed only for the 1-hour averaging time. In an effort to mitigate statistical problems due to spatial correlation, selection rules stipulated that only one value could be selected from a given event.

The first two columns of results in the Appendix A tables are simply the average of the "N" highest observed values and the average of the "N" highest predicted values for each data set. The first performance measure (third column) is the difference between these averages. A positive value implies model underprediction. In parentheses following the calculated value is the 95 percent confidence interval, determined by using the two-sample Student's t test.

The second performance measure is the difference between the medians of the observed and predicted values. The 95 percent confidence interval (in parentheses) is determined using the nonparametric Mann-Whitney test.

The third performance measure is the variance comparison. The variance of the highest observed values was divided by the variance of the predicted values. The variance ratio is presented, together with the 95 percent confidence interval (in parentheses), determined using an F test.

The final performance measure in Table A is the frequency distribution comparison. The cumulative distribution function f(C) represents the fraction of the data set (in this case, the fraction of the "N" highest data points) with concentrations values less than or equal to C. The value presented in

this column is the largest difference between the observed and predicted distribution functions (for the same concentration values) obtained when the two functions are compared for all concentration values.

A positive fractional difference implies model overprediction. At the concentration value where the maximum difference occurs, the fraction of observed values less than or equal to that concentration value is larger than the fraction of predicted values. Conversely, the fraction of observed values higher than that concentration value is smaller than the fraction of predicted values.

The value given in parentheses is the maximum difference which is significantly different from zero, at a 95 percent confidence level, as given by the Kolmogorov-Smirnov (K-S) test. This confidence interval is a function of the number of cases.

TABLE A1
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPR (FRACTION)
1. ALL STATIONS/ALL EVENTS(16)	3.4	3.3	.1 (-.3, .4)	.1 (-.3, .4)	1.03 (.36, 2.95)	.19 (.481)
2. BY STATION/ALL EVENTS						
STATION 1(16)	.9	1.0	-.1 (-.4, .1)	.0 (-.4, .2)	1.00 (.35, 2.87)	.25 (.481)
STATION 2(16)	2.8	2.7	.1 (-.5, .7)	-.3 (-.7, .8)	.28 (.10, .79)	.31 (.481)
STATION 3(16)	3.1	2.7	.4 (.0, .7)	.3 (.1, .6)	2.50 (.87, 7.16)	-.63 (.481)
STATION 4(16)	1.9	1.7	.2 (.1, .4)	.2 (.1, .4)	.38 (.13, 1.09)	-.50 (.481)
STATION 5(16)	1.2	1.2	.1 (-.1, .2)	.0 (-.1, .2)	.27 (.09, .76)	-.19 (.481)
STATION 6(16)	.9	.9	.0 (-.1, .1)	.0 (.0, .1)	.20 (.07, .56)	-.38 (.481)
STATION 7(16)	.5	.5	.0 (-.1, .1)	.0 (-.1, .1)	.29 (.10, .84)	.25 (.481)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(7)	3.4	3.6	-.2 (-.6, .3)	-.2 (-.6, .3)	.22 (.04, 1.27)	.43 (.727)
2.0 TO 4.0(9)	3.3	3.1	.2 (-.4, .8)	.2 (-.4, .7)	2.27 (.51, 10.06)	-.33 (.641)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (7)	2.9	2.7	.2 (-.3, .8)	.4 (-.4, .8)	.17 (.03, 1.00)	-.71 (.727)
CLASS NEUT (2)	2.9	3.1	-.2 (-4.6, 4.3)	-.3 (.0, -1.0)	.65 (.00,419.57)	.50 (1.360)
CLASS STAB (7)	3.7	3.6	.1 (-.4, .7)	.0 (-.3, .5)	2.33 (.41, 13.85)	-.29 (.727)
C. BY WND/RD ANG						
<20. DEGREES(6)	3.7	3.5	.2 (-.4, .9)	.1 (-.4, 1.0)	3.33 (.47, 23.77)	-.33 (.785)
20. TO 60.(6)	3.3	3.2	.0 (-.7, .8)	.0 (-.9, .9)	.24 (.03, 1.70)	-.33 (.785)
>60. DEGREES(5)	2.9	2.8	.1 (-.6, .9)	.3 (-.8, .9)	.50 (.05, 4.79)	-.40 (.860)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A2
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(16)	3.4	5.3	-1.9 (-4.3, .6)	-.9 (-1.3, -.4)	.01 (.00, .03)	.75 (.481)
2. BY STATION/ALL EVENTS						
STATION 1(16)	.9	3.1	-2.2 (-5.0, .5)	-.7 (-1.9, .0)	.00 (.00, .01)	.50 (.481)
STATION 2(16)	2.8	3.5	-.7 (-2.5, 1.2)	.4 (-.3, .7)	.02 (.01, .06)	-.38 (.481)
STATION 3(16)	3.1	3.9	-.8 (-2.0, .4)	-.8 (-1.1, .3)	.07 (.02, .19)	.44 (.481)
STATION 4(16)	1.9	2.9	-1.0 (-2.0, .1)	-.6 (-.8, -.3)	.01 (.00, .03)	.63 (.481)
STATION 5(16)	1.2	2.4	-1.2 (-2.1, -.4)	-.9 (-1.1, -.6)	.01 (.00, .03)	.94 (.481)
STATION 6(16)	.9	2.2	-1.3 (-2.0, -.6)	-.8 (-1.5, -.6)	.01 (.00, .03)	1.00 (.481)
STATION 7(16)	.5	2.0	-1.4 (-2.2, -.7)	-.7 (-2.9, -.5)	.01 (.01, .04)	.88 (.481)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(7)	3.4	6.7	-3.3 (-9.6, 3.0)	-.9 (-1.6, -.3)	.00 (.00, .01)	.86 (.727)
2.0 TO 4.0(9)	3.3	3.8	-.5 (-1.5, .6)	-.9 (-1.6, .7)	.33 (.08, 1.48)	.56 (.641)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (7)	2.9	2.5	.4 (.1, .8)	.4 (.1, .8)	.52 (.09, 3.02)	-.71 (.727)
CLASS NEUT (2)	2.9	12.1	-9.2 (-134.8, 116.4)	-18.6 (.0, -.1)	.00 (.00, 2.47)	.50 (1.360)
CLASS STAB (7)	3.7	4.7	-.9 (-1.5, -.4)	-1.1 (-1.4, -.6)	2.61 (.45, 15.17)	.86 (.727)
C. BY WND/RD ANG						
<20. DEGREES(6)	3.7	7.6	-3.9 (-11.4, 3.7)	-1.2 (-18.5, -.4)	.01 (.00, .05)	.83 (.785)
20. TO 60.(6)	3.3	3.6	-.3 (-1.1, .4)	-.4 (-1.3, .4)	.26 (.04, 1.84)	.33 (.785)
>60. DEGREES(5)	2.9	3.3	-.4 (-1.7, 1.0)	-.2 (-1.8, 1.0)	.13 (.01, 1.25)	.40 (.860)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A3
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM75 AVERAGING TIME: HALF HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(16)	3.4	5.2	-1.9 (-2.8, -.9)	-1.3 (-3.0, -.6)	.08 (.03, .24)	.63 (.481)
2. BY STATION/ALL EVENTS						
STATION 1(16)	.9	1.5	-.6 (-1.0, -.2)	-.3 (-.8, -.1)	.29 (.10, .82)	.50 (.481)
STATION 2(16)	2.8	3.6	-.7 (-1.5, .1)	-.7 (-1.3, .3)	.14 (.05, .39)	.31 (.481)
STATION 3(16)	3.1	4.8	-1.7 (-2.7, -.7)	-1.5 (-2.1, -.4)	.10 (.03, .29)	.63 (.481)
STATION 4(16)	1.9	3.9	-2.0 (-2.7, -1.2)	-2.3 (-2.7, -.8)	.02 (.01, .06)	1.00 (.481)
STATION 5(16)	1.2	3.0	-1.8 (-2.3, -1.2)	-2.2 (-2.5, -.8)	.03 (.01, .08)	1.00 (.481)
STATION 6(16)	.9	2.4	-1.5 (-1.9, -1.1)	-1.7 (-2.0, -.8)	.04 (.01, .10)	1.00 (.481)
STATION 7(16)	.5	1.6	-1.0 (-1.4, -.7)	-.8 (-1.4, -.6)	.09 (.03, .24)	.94 (.481)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(7)	3.4	4.4	-1.0 (-1.8, -.2)	-1.2 (-1.4, -.2)	.06 (.01, .35)	.71 (.727)
2.0 TO 4.0(9)	3.3	5.9	-2.6 (-4.2, -1.0)	-3.0 (-4.5, -.5)	.12 (.03, .55)	.67 (.641)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (7)	2.9	3.0	-.1 (-.7, .6)	-.3 (-.8, .7)	.14 (.02, .81)	.43 (.727)
CLASS NEUT (2)	2.9	4.6	-1.6 (-11.4, 8.2)	-2.3 (.0, -.9)	.21 (.00,137.87)	.50 (1.360)
CLASS STAB (7)	3.7	6.7	-3.0 (-4.3, -1.8)	-3.6 (-4.3, -1.4)	.17 (.03, 1.00)	.86 (.727)
C. BY WND/RD ANG						
<20. DEGREES(6)	3.7	7.2	-3.5 (-4.5, -2.5)	-4.1 (-4.5, -2.3)	.46 (.06, 3.30)	1.00 (.785)
20. TO 60.(6)	3.3	3.6	-.3 (-1.1, .4)	.1 (-1.3, .4)	.26 (.04, 1.84)	-.33 (.785)
>60. DEGREES(5)	2.9	2.3	.6 (.1, 1.2)	.8 (.0, 1.2)	1.21 (.13, 11.58)	-.60 (.860)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A4
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(16)	3.4	3.5	-.1 (-.4, .3)	.0 (-.4, .3)	1.11 (.39, 3.18)	.19 (.481)
2. BY STATION/ALL EVENTS						
STATION 1(16)	.9	1.6	-.7 (-1.2, -.3)	-.4 (-1.2, -.1)	.19 (.07, .56)	.50 (.481)
STATION 2(16)	2.8	3.0	-.1 (-.6, .4)	-.1 (-.6, .4)	.44 (.15, 1.26)	.25 (.481)
STATION 3(16)	3.1	3.0	.1 (-.2, .5)	-.3 (-.4, .4)	1.80 (.63, 5.16)	-.31 (.481)
STATION 4(16)	1.9	2.3	-.4 (-.6, -.2)	-.4 (-.6, -.2)	.38 (.13, 1.09)	.69 (.481)
STATION 5(16)	1.2	1.7	-.5 (-.7, -.4)	-.4 (-.6, -.3)	.27 (.09, .75)	.88 (.481)
STATION 6(16)	.9	1.3	-.4 (-.6, -.3)	-.4 (-.5, -.3)	.20 (.07, .56)	.81 (.481)
STATION 7(16)	.5	.9	-.3 (-.4, -.2)	-.4 (-.4, -.2)	.29 (.10, .84)	.75 (.481)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(7)	3.4	3.8	-.4 (-.8, .1)	-.4 (-.9, .1)	.18 (.03, 1.07)	.57 (.727)
2.0 TO 4.0(9)	3.3	3.0	.3 (-.3, .9)	.1 (-.4, .9)	2.22 (.50, 9.86)	-.33 (.641)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (7)	2.9	2.6	.4 (.1, .6)	.4 (.1, .7)	.64 (.11, 3.70)	-.86 (.727)
CLASS NEUT (2)	2.9	3.5	-.5 (-8.0, 6.9)	-1.0 (.0, -.1)	.30 (.00,193.61)	.50 (1.360)
CLASS STAB (7)	3.7	3.7	.0 (-.5, .6)	-.2 (-.4, .4)	3.05 (.52, 17.75)	.29 (.727)
C. BY WND/RD ANG						
<20. DEGREES(6)	3.7	3.6	.1 (-.6, .8)	.1 (-.9, 1.2)	1.45 (.20, 10.37)	-.33 (.785)
20. TO 60.(6)	3.3	3.3	-.1 (-.7, .6)	-.1 (-.9, .7)	.33 (.05, 2.37)	.33 (.785)
>60. DEGREES(5)	2.9	2.9	.0 (-.8, .8)	.2 (-1.0, .8)	.43 (.04, 4.09)	-.40 (.860)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A5
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(5)	8.6	9.1	-.5 (-2.6, 1.5)	.2 (-3.1, 2.1)	.48 (.05, 4.56)	.40 (.860)
2. BY STATION/ALL EVENTS						
STATION 1(5)	3.6	2.4	1.1 (-2.3, 4.5)	.0 (-.3, 6.1)	76.33 (7.95,733.11)	.60 (.860)
STATION 2(5)	3.9	3.1	.8 (-1.1, 2.7)	.3 (-.3, 3.5)	23.83 (2.49,229.35)	-.40 (.860)
STATION 3(5)	4.6	4.1	.5 (-.3, 1.3)	.4 (-.5, 1.6)	1.56 (.16, 15.00)	-.80 (.860)
STATION 4(5)	7.3	7.3	.0 (-1.2, 1.2)	-.2 (-1.4, 1.6)	.55 (.06, 5.54)	.20 (.860)
STATION 5(5)	7.4	6.7	.8 (-4.1, 5.6)	2.5 (-5.4, 5.9)	.32 (.03, 3.07)	.40 (.860)
STATION 6(5)	3.1	4.2	-1.1 (-4.2, 2.1)	-.6 (-5.6, 2.1)	.21 (.02, 2.03)	.40 (.860)
STATION 7(5)	3.2	3.1	.1 (-2.6, 2.7)	.9 (-3.4, 3.4)	.53 (.05, 5.05)	-.40 (.860)
STATION 8(5)	2.9	2.4	.4 (-2.1, 3.0)	.6 (-3.0, 4.3)	1.02 (.11, 9.82)	-.60 (.860)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(2)	8.5	9.5	-1.0 (-20.6, 18.6)	-2.5 (.0, -1.3)	.00 (.00, .67)	.50 (1.360)
2.0 TO 4.0(2)	8.9	9.4	-.5 (-8.9, 7.9)	-.2 (.0, -1.3)	1.59 (.00,******)	.50 (1.360)
> 4.0 M/SEC(2)	4.5	3.3	1.3 (-2.5, 5.0)	1.0 (.0, -1.3)	.35 (.00,226.43)	-1.00 (1.360)
B. STABILITY GROUP						
CLASS UNST (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
CLASS NEUT (4)	8.1	7.9	.2 (-3.0, 3.4)	-.8 (-3.6, 4.1)	.59 (.04, 9.12)	-.50 (.962)
CLASS STAB (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
C. BY WND/RD ANG						
<20. DEGREES(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
20. TO 60.(3)	8.8	8.3	.5 (-3.9, 4.9)	.5 (.0, 1.2)	.47 (.01, 18.49)	-.33 (1.110)
>60. DEGREES(2)	7.4	8.2	-.8 (-23.3, 21.8)	-2.5 (.0, .5)	.16 (.00,105.40)	.50 (1.360)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A6
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(5)	8.6	9.6	-1.0 (-3.4, 1.4)	-1.4 (-3.4, 1.7)	.33 (.03, 3.12)	.60 (.860)
2. BY STATION/ALL EVENTS						
STATION 1(5)	3.6	2.2	1.3 (-2.1, 4.8)	.2 (-.2, 6.3)	76.33 (7.95,733.11)	-.60 (.860)
STATION 2(5)	3.9	2.8	1.1 (-.8, 3.0)	.7 (-.1, 3.9)	23.88 (2.49,229.35)	-.60 (.860)
STATION 3(5)	4.6	3.8	.8 (.0, 1.6)	.9 (-.1, 2.1)	1.35 (.14, 12.99)	-.80 (.860)
STATION 4(5)	7.3	7.7	-.3 (-3.0, 2.3)	.6 (-3.4, 2.0)	.11 (.01, 1.04)	.40 (.860)
STATION 5(5)	7.4	6.8	.6 (-2.7, 4.0)	.1 (-3.0, 4.3)	.85 (.09, 8.21)	-.40 (.860)
STATION 6(5)	3.1	4.2	-1.1 (-5.2, 3.0)	.1 (-7.3, 2.8)	.12 (.01, 1.18)	-.60 (.860)
STATION 7(5)	3.2	3.8	-.6 (-5.6, 4.4)	1.4 (-7.9, 3.9)	.13 (.01, 1.29)	-.60 (.860)
STATION 8(5)	2.9	3.6	-.8 (-6.4, 4.9)	1.0 (-9.6, 4.7)	.14 (.01, 1.34)	-.60 (.860)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(2)	8.5	11.3	-2.8 (-8.4, 2.8)	-3.2 (.0, -5.9)	.01 (.00, 7.65)	1.00 (1.360)
2.0 TO 4.0(2)	8.9	8.4	.6 (-8.4, 9.5)	.5 (.0, -5.9)	.93 (.00,605.32)	-.50 (1.360)
> 4.0 M/SEC(2)	4.5	2.8	1.7 (-1.6, 5.1)	1.5 (.0, -5.9)	.40 (.00,262.33)	-1.00 (1.360)
B. STABILITY GROUP						
CLASS UNST (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
CLASS NEUT (4)	8.1	7.2	.9 (-2.1, 3.9)	.6 (-2.9, 4.9)	.67 (.04, 10.31)	-.75 (.960)
CLASS STAB (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
C. BY WND/RD ANG						
<20. DEGREES(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
20. TO 60.(3)	8.8	8.5	.3 (-3.1, 3.7)	-.2 (.0, 1.0)	.95 (.02, 37.15)	.33 (1.110)
>60. DEGREES(2)	7.4	8.6	-1.2 (-28.0, 25.6)	-3.2 (.0, .5)	.13 (.00, 84.98)	.50 (1.360)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A7
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/HYS76 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVEPAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(5)	8.6	11.3	-2.7 (-6.5, 1.2)	-1.2 (-8.0, .7)	.12 (.01, 1.17)	.80 (.860)
2. BY STATION/ALL EVENTS						
STATION 1(5)	3.6	4.1	-.5 (-3.9, 2.9)	-1.8 (-2.1, 4.3)	72.23 (7.52,693.77)	.80 (.860)
STATION 2(5)	3.9	5.0	-1.0 (-2.9, .8)	-1.5 (-2.5, 1.7)	6.05 (.63, 58.15)	.80 (.860)
STATION 3(5)	4.6	6.3	-1.7 (-3.4, .1)	-1.3 (-4.2, -.1)	.17 (.02, 1.61)	.80 (.860)
STATION 4(5)	7.3	9.9	-2.5 (-7.3, 2.3)	-1.2 (-9.0, 1.0)	.03 (.00, .31)	.60 (.860)
STATION 5(5)	7.4	8.1	-.7 (-4.8, 3.4)	-2.1 (-4.8, 3.9)	.48 (.05, 4.57)	.40 (.860)
STATION 6(5)	3.1	4.7	-1.5 (-4.7, 1.6)	-.7 (-5.7, 2.0)	.21 (.02, 2.04)	.60 (.860)
STATION 7(5)	3.2	3.7	-.5 (-3.2, 2.1)	.6 (-3.5, 3.1)	.53 (.06, 5.13)	.40 (.860)
STATION 8(5)	2.9	3.1	-.2 (-2.7, 2.3)	.3 (-3.1, 4.0)	1.09 (.11, 10.51)	-.40 (.860)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(2)	8.5	13.1	-4.5 (-47.9, 38.9)	-7.9 (.0, -2.7)	.00 (.00, .14)	1.00 (1.360)
2.0 TO 4.0(2)	8.9	10.3	-1.3 (-10.5, 7.8)	-1.4 (.0, -2.7)	.88 (.00,566.90)	.50 (1.360)
> 4.0 M/SEC(2)	4.5	3.7	.9 (-3.2, 4.9)	.6 (.0, -2.7)	.31 (.00,203.15)	-.50 (1.360)
B. STABILITY GROUP						
CLASS UNST (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
CLASS NEUT (4)	8.1	8.8	-.7 (-4.1, 2.8)	-1.2 (-4.8, 3.9)	.47 (.03, 7.30)	.50 (.962)
CLASS STAB (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
C. BY WND/RD ANG						
<20. DEGREES(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
20. TO 60.(3)	8.8	9.8	-1.0 (-5.0, 3.0)	-1.0 (.0, -.5)	.58 (.01, 22.66)	.33 (1.110)
>60. DEGREES(2)	7.4	8.0	-.5 (-10.4, 9.3)	-1.1 (.0, -1.0)	.48 (.00,310.89)	.50 (1.360)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A8
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	DIFFERENCE OF MEDIANS* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(5)	8.6	11.4	-2.8 (-4.7, -.9)	-2.4 (-5.4, -.5)	.59 (.06, 5.66)	.80 (.860)
2. BY STATION/ALL EVENTS						
STATION 1(5)	3.6	3.1	.5 (-2.9, 3.9)	-.4 (-1.8, 5.7)	17.03 (1.77,163.52)	.80 (.860)
STATION 2(5)	3.9	3.9	.0 (-1.9, 1.9)	-.1 (-2.0, 3.1)	3.45 (.36, 33.18)	.40 (.860)
STATION 3(5)	4.6	5.1	-.5 (-2.0, .9)	-.2 (-2.8, 1.0)	.25 (.03, 2.41)	.60 (.860)
STATION 4(5)	7.3	9.3	-1.9 (-4.3, .4)	-2.9 (-4.1, .8)	.13 (.01, 1.29)	.60 (.860)
STATION 5(5)	7.4	8.0	-.6 (-5.9, 4.7)	2.1 (-6.4, 5.0)	.27 (.03, 2.58)	.40 (.860)
STATION 6(5)	3.1	5.0	-1.9 (-7.0, 3.2)	-.8 (-9.5, 1.9)	.08 (.01, .76)	.40 (.860)
STATION 7(5)	3.2	4.0	-.8 (-5.4, 3.7)	.7 (-7.3, 3.2)	.16 (.02, 1.56)	-.40 (.860)
STATION 8(5)	2.9	3.3	-.4 (-4.4, 3.6)	.4 (-6.6, 4.1)	.29 (.03, 2.77)	-.40 (.860)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(2)	8.5	12.4	-3.9 (-22.7, 15.0)	-5.3 (.0, -2.9)	.00 (.00, .73)	1.00 (1.360)
2.0 TO 4.0(2)	8.9	10.8	-1.8 (-15.7, 12.0)	-.8 (.0, -2.9)	12.21 (.02,******)	.50 (1.360)
> 4.0 M/SEC(2)	4.5	3.4	1.1 (-2.5, 4.8)	.9 (.0, -2.9)	.36 (.00,231.88)	-1.00 (1.360)
B. STABILITY GROUP						
CLASS UNST (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
CLASS NEUT (4)	8.1	9.0	-.9 (-4.2, 2.4)	-2.9 (-4.2, 3.7)	.53 (.03, 8.20)	.50 (.962)
CLASS STAB (0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
C. BY WND/RD ANG						
<20. DEGREES(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
20. TO 60.(3)	8.8	9.9	-1.1 (-4.9, 2.8)	-2.1 (.0, -.3)	.63 (.02, 24.59)	.67 (1.110)
>60. DEGREES(2)	7.4	10.1	-2.6 (-38.5, 33.3)	-5.3 (.0, -.8)	.09 (.00, 58.10)	.50 (1.360)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A9
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(11)	7.8	7.6	.2 (-1.7, 2.0)	1.0 (-1.6, 2.3)	1.16 (.31, 4.30)	-.27 (.580)
2. BY STATION/ALL EVENTS						
STATION 1/14 (9)	2.5	2.0	.5 (-.1, 1.1)	.4 (-.1, .9)	2.08 (.47, 9.23)	-.44 (.641)
STATION 2/13 (10)	1.7	2.2	-.5 (-1.1, .2)	-.7 (-1.2, .4)	2.31 (.57, 9.31)	.60 (.608)
STATION 3/12 (11)	3.0	2.5	.4 (-.2, 1.1)	.4 (-.3, 1.1)	1.44 (.39, 5.36)	-.45 (.580)
STATION 4/11 (11)	3.0	3.1	-.1 (-.9, .8)	-.2 (-.9, .6)	1.76 (.47, 6.53)	-.18 (.580)
STATION 5/10 (11)	4.1	4.9	-.8 (-1.8, .2)	-1.1 (-1.8, .3)	.67 (.18, 2.49)	.45 (.580)
STATION 6/ 9 (14)	6.9	7.0	.0 (-1.8, 1.8)	.2 (-1.8, 2.1)	1.30 (.42, 4.06)	-.21 (.514)
STATION 7/ 8 (11)	4.7	6.5	-1.8 (-3.4, -.2)	-2.0 (-3.4, -.3)	1.27 (.34, 4.70)	.64 (.580)
STATION 15/21 (11)	3.2	4.0	-.8 (-1.6, .0)	-1.0 (-1.6, -.1)	.53 (.14, 1.96)	.55 (.580)
STATION 16/22 (11)	3.2	3.7	-.5 (-1.2, .3)	-.5 (-1.2, .3)	.76 (.20, 2.81)	.36 (.580)
STATION 17/19 (12)	5.5	6.3	-.8 (-2.2, .6)	-.7 (-2.1, .7)	.90 (.26, 3.14)	.42 (.555)
STATION 18/20 (11)	4.4	5.1	-.7 (-2.1, .7)	-1.4 (-2.0, .3)	1.45 (.39, 5.41)	.45 (.580)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(6)	8.7	8.9	-.3 (-2.7, 2.2)	.3 (-3.1, 2.3)	1.20 (.17, 8.56)	-.33 (.785)
2.0 TO 4.0(5)	6.3	5.4	.9 (-2.1, 3.8)	-.6 (-1.6, 4.5)	9.85 (1.03, 94.59)	.40 (.860)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (6)	5.7	4.3	1.4 (-.8, 3.6)	1.5 (-.5, 4.6)	2.25 (.31, 16.06)	-.50 (.785)
CLASS NEUT (3)	10.3	9.9	.5 (-4.1, 5.0)	1.5 (.0, .2)	.10 (.00, 3.87)	-.67 (1.110)
CLASS STAB (2)	5.6	8.4	-2.8 (-7.2, 1.6)	-3.1 (.0, 1.1)	.07 (.00, 43.26)	1.00 (1.360)
C. BY WND/RD ANG						
<20. DEGREES(2)	7.2	6.2	1.0 (-15.5, 17.5)	.0 (.0, 1.1)	.39 (.00,251.35)	.50 (1.360)
20. TO 60.(7)	6.0	6.7	-.7 (-3.2, 1.8)	-1.6 (-3.3, 2.3)	3.99 (.69, 23.20)	.71 (.727)
>60. DEGREES(3)	9.7	9.3	.4 (-6.0, 6.7)	1.0 (.0, -3.2)	.05 (.00, 2.14)	-.67 (1.110)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A10
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FFRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(11)	7.8	5.5	2.2 (.3, 4.1)	3.5 (.5, 4.7)	1.04 (.28, 3.88)	-.55 (.580)
2. BY STATION/ALL EVENTS						
STATION 1/14 (8)	2.6	1.8	.7 (.0, 1.4)	.7 (.1, 1.3)	.92 (.18, 4.59)	-.75 (.680)
STATION 2/13 (8)	1.9	2.0	-.1 (-.9, .7)	.2 (-.9, .9)	1.19 (.24, 5.95)	.38 (.680)
STATION 3/12 (9)	3.1	2.2	1.0 (.2, 1.8)	1.0 (.2, 1.8)	.82 (.18, 3.63)	-.67 (.641)
STATION 4/11 (11)	3.0	2.3	.7 (-.2, 1.6)	.8 (.0, 1.4)	1.23 (.33, 4.59)	-.45 (.580)
STATION 5/10 (12)	4.0	3.3	.7 (-.4, 1.7)	.9 (-.2, 1.9)	.62 (.18, 2.15)	-.58 (.555)
STATION 6/ 9 (14)	6.9	5.0	1.9 (.1, 3.7)	2.9 (.3, 4.2)	1.38 (.44, 4.28)	-.50 (.514)
STATION 7/ 8 (12)	4.5	4.4	.1 (-1.4, 1.6)	.5 (-1.1, 1.2)	1.20 (.34, 4.16)	.17 (.555)
STATION 15/21 (12)	3.1	2.8	.3 (-.5, 1.1)	.5 (-.4, 1.2)	.50 (.14, 1.73)	-.42 (.555)
STATION 16/22 (12)	3.1	2.7	.4 (-.4, 1.2)	.8 (-.3, 1.2)	.55 (.16, 1.91)	-.50 (.555)
STATION 17/19 (12)	5.5	4.4	1.1 (-.3, 2.5)	1.9 (.0, 2.5)	.88 (.25, 3.05)	-.58 (.555)
STATION 18/20 (12)	4.2	4.1	.2 (-1.3, 1.6)	.4 (-.8, 1.2)	1.05 (.30, 3.63)	-.33 (.555)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(6)	8.7	6.8	1.8 (-.8, 4.5)	2.3 (-1.5, 4.9)	.82 (.12, 5.89)	-.50 (.785)
2.0 TO 4.0(5)	6.3	3.7	2.6 (-.4, 5.6)	1.1 (.5, 6.2)	19.47 (2.03,186.96)	-1.00 (.860)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (6)	5.7	3.2	2.5 (.4, 4.6)	2.7 (.3, 5.0)	6.26 (.88, 44.71)	-.67 (.785)
CLASS NEUT (3)	10.3	6.9	3.5 (1.6, 5.4)	3.6 (.0, 1.1)	.48 (.01, 18.79)	-1.00 (1.110)
CLASS STAB (2)	5.6	7.9	-2.3 (-34.8, 30.2)	-4.8 (.0, 3.6)	.00 (.00, 1.29)	.50 (1.360)
C. BY WND/RD ANG						
<20. DEGREES(2)	7.2	7.2	.0 (-23.0, 23.1)	-1.7 (.0, 3.6)	.25 (.00,162.43)	.50 (1.360)
20. TO 60.(7)	6.0	4.4	1.6 (-.9, 4.0)	.5 (-.7, 4.4)	7.16 (1.23, 41.64)	-.57 (.727)
>60. DEGREES(3)	9.7	6.3	3.3 (-.5, 7.1)	3.1 (.0, -.5)	.13 (.00, 5.24)	-1.00 (1.110)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A11
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVEPAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FFRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(11)	7.8	15.2	-7.4 (-13.8, -.9)	-4.0 (-9.0, -1.0)	.05 (.01, .20)	.55 (.580)
2. BY STATION/ALL EVENTS						
STATION 1/14 (12)	2.3	6.6	-4.3 (-6.2, -2.5)	-3.3 (-5.7, -2.3)	.05 (.02, .18)	.92 (.555)
STATION 2/13 (12)	1.6	7.3	-5.7 (-7.8, -3.6)	-4.9 (-7.0, -3.3)	.06 (.02, .21)	1.00 (.555)
STATION 3/12 (12)	2.9	8.1	-5.2 (-7.6, -2.8)	-4.1 (-6.4, -2.5)	.04 (.01, .15)	.92 (.555)
STATION 4/11 (12)	2.9	9.1	-6.2 (-9.0, -3.4)	-5.2 (-7.3, -3.1)	.06 (.02, .19)	.92 (.555)
STATION 5/10 (12)	4.0	11.8	-7.8 (-12.1, -3.6)	-7.0 (-8.1, -3.6)	.03 (.01, .09)	.92 (.555)
STATION 6/ 9 (14)	6.9	13.7	-6.8 (-12.0, -1.5)	-4.6 (-7.4, -1.8)	.08 (.03, .24)	.50 (.514)
STATION 7/ 8 (12)	4.5	13.5	-9.0 (-14.4, -3.6)	-7.5 (-9.4, -4.0)	.05 (.01, .18)	.83 (.555)
STATION 15/21 (12)	3.1	10.5	-7.4 (-10.9, -3.9)	-6.6 (-8.0, -3.8)	.02 (.01, .07)	1.00 (.555)
STATION 16/22 (12)	3.1	9.5	-6.3 (-9.8, -2.8)	-5.5 (-6.5, -2.8)	.02 (.01, .08)	.92 (.555)
STATION 17/19 (12)	5.5	13.6	-8.0 (-13.4, -2.7)	-6.1 (-8.6, -3.0)	.04 (.01, .13)	.83 (.555)
STATION 18/20 (12)	4.2	11.7	-7.5 (-12.7, -2.3)	-5.6 (-8.1, -2.9)	.05 (.01, .16)	.83 (.555)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(6)	8.7	20.3	-11.6 (-22.6, -.6)	-8.9 (-27.5, -2.9)	.03 (.00, .25)	1.00 (.785)
2.0 TO 4.0(5)	6.3	6.0	.3 (-2.6, 3.3)	-.9 (-2.1, 4.2)	10.47 (1.09,100.55)	.60 (.860)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (6)	5.7	13.0	-7.4 (-20.5, 5.8)	-4.1 (-30.6, 1.8)	.02 (.00, .17)	.50 (.785)
CLASS NEUT (3)	10.3	12.2	-1.8 (-13.8, 10.1)	.4 (.0, -8.7)	.02 (.00, .66)	-.33 (1.110)
CLASS STAB (2)	5.6	20.0	-14.4 (-116.5, 87.7)	-22.3 (.0, .4)	.00 (.00, .13)	1.00 (1.360)
C. BY WND/RD ANG						
<20. DEGREES(2)	7.2	32.9	-25.7 (-67.4, 16.0)	-28.8 (.0, .4)	.12 (.00, 77.92)	1.00 (1.360)
20. TO 60.(7)	6.0	9.4	-3.4 (-6.1, -.8)	-4.5 (-7.2, -.9)	1.71 (.29, 9.98)	.71 (.727)
>60. DEGREES(3)	9.7	13.9	-4.3 (-13.9, 5.3)	-4.3 (.0, -7.1)	.03 (.00, .99)	.67 (1.110)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A12
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(11)	7.8	9.8	-2.0 (-4.8, .7)	-1.0 (-4.7, 1.2)	.35 (.09, 1.29)	.36 (.580)
2. BY STATION/ALL EVENTS						
STATION 1/14 (10)	2.4	3.5	-1.1 (-2.2, .0)	-.6 (-2.3, .0)	.20 (.05, .80)	.60 (.608)
STATION 2/13 (11)	1.7	3.8	-2.1 (-3.3, -.9)	-2.2 (-3.2, -.9)	.23 (.06, .85)	.64 (.580)
STATION 3/12 (11)	3.0	4.4	-1.4 (-2.8, -.1)	-1.1 (-2.9, -.1)	.15 (.04, .57)	.55 (.580)
STATION 4/11 (12)	2.9	5.0	-2.1 (-3.6, -.5)	-1.6 (-2.9, -.5)	.20 (.06, .72)	.67 (.555)
STATION 5/10 (12)	4.0	7.3	-3.3 (-5.3, -1.2)	-3.0 (-4.3, -1.2)	.11 (.03, .39)	.58 (.555)
STATION 6/ 9 (14)	6.9	8.9	-2.0 (-4.4, .4)	-.9 (-4.0, .8)	.46 (.15, 1.42)	.43 (.514)
STATION 7/ 8 (12)	4.5	8.7	-4.2 (-6.6, -1.8)	-4.1 (-6.0, -1.9)	.30 (.09, 1.04)	.75 (.555)
STATION 15/21 (12)	3.1	6.2	-3.1 (-4.9, -1.3)	-2.7 (-3.8, -1.2)	.08 (.02, .29)	.75 (.555)
STATION 16/22 (12)	3.1	5.5	-2.4 (-4.0, -.8)	-1.9 (-3.0, -.8)	.12 (.03, .40)	.67 (.555)
STATION 17/19 (12)	5.5	8.7	-3.2 (-5.6, -.9)	-2.8 (-5.0, -.8)	.22 (.06, .75)	.58 (.555)
STATION 18/20 (12)	4.2	7.1	-2.9 (-4.9, -.9)	-2.6 (-4.7, -1.1)	.37 (.11, 1.30)	.75 (.555)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(6)	8.7	12.3	-3.6 (-7.2, -.1)	-3.7 (-8.2, .3)	.36 (.05, 2.57)	.50 (.785)
2.0 TO 4.0(5)	6.3	5.6	.7 (-2.3, 3.6)	-.6 (-1.8, 4.5)	9.82 (1.02, 94.33)	.60 (.860)
> 4.0 M/SEC(0)	.0	.0	.0 (.0, .0)	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST (6)	5.7	7.1	-1.4 (-5.6, 2.8)	-.9 (-7.8, 2.6)	.25 (.03, 1.75)	.33 (.785)
CLASS NEUT (3)	10.3	11.8	-1.5 (-12.7, 9.8)	.8 (.0, -2.2)	.02 (.00, .75)	-.67 (1.110)
CLASS STAB (2)	5.6	11.7	-6.0 (-17.5, 5.4)	-6.9 (.0, .8)	.01 (.00, 9.39)	1.00 (1.360)
C. BY WND/RD ANG						
<20. DEGREES(2)	7.2	8.7	-1.5 (-13.1, 10.0)	-1.9 (.0, .8)	.70 (.00,453.92)	.50 (1.360)
20. TO 60.(7)	6.0	7.8	-1.8 (-4.7, 1.1)	-1.8 (-4.2, 1.5)	1.13 (.19, 6.59)	.71 (.727)
>60. DEGREES(3)	9.7	13.8	-4.2 (-13.8, 5.4)	-5.1 (.0, -4.2)	.03 (.00, 1.00)	.67 (1.110)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A13
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	4.7	7.1	-2.4 (-3.2, -1.6)	-2.3 (-2.8, -1.4)	.17 (.08, .40)	.84 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	2.2	2.8	-.6 (-.9, -.2)	-.6 (-.9, -.4)	1.18 (.52, 2.68)	.60 (.385)
STATION 2(25)	4.2	5.8	-1.6 (-2.3, -.9)	-1.6 (-2.4, -.5)	.13 (.06, .30)	.56 (.385)
STATION 3(25)	3.9	5.2	-1.3 (-2.4, -.2)	-.3 (-1.5, -.1)	.19 (.08, .43)	.40 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	3.9	6.7	-2.8 (-3.7, -1.8)	-2.7 (-3.5, -1.4)	.08 (.03, .18)	.72 (.385)
2.0 TO 4.0(25)	3.8	4.0	-.2 (-.8, .5)	-.1 (-.4, .4)	.58 (.26, 1.32)	-.24 (.385)
> 4.0 M/SEC(14)	3.8	2.5	1.3 (.4, 2.3)	2.0 (.5, 2.4)	1.10 (.35, 3.42)	-.71 (.514)
B. STABILITY GROUP						
CLASS UNST (11)	3.6	3.2	.4 (-.6, 1.3)	.3 (-.5, 1.5)	.80 (.22, 2.98)	-.27 (.580)
CLASS NEUT (25)	4.6	7.0	-2.5 (-3.3, -1.7)	-2.5 (-2.9, -1.4)	.19 (.08, .44)	.80 (.385)
CLASS STAB (14)	2.0	3.1	-1.0 (-1.5, -.6)	-1.2 (-1.3, -.7)	.38 (.12, 1.18)	.86 (.514)
C. BY WND/RD ANG						
<20. DEGREES(15)	4.0	6.7	-2.8 (-3.7, -1.8)	-2.6 (-3.5, -1.8)	.35 (.12, 1.03)	.87 (.497)
20. TO 60.(25)	3.8	4.3	-.4 (-1.1, .2)	.4 (-.4, .4)	.12 (.05, .27)	.24 (.385)
>60. DEGREES(25)	3.8	4.3	-.5 (-1.6, .6)	-.2 (-.5, .5)	.23 (.10, .53)	-.20 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

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TABLE A14
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	4.7	17.2	-12.5 (-15.1, -10.0)	-11.8 (-12.3, -9.5)	.01 (.01, .03)	1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	2.2	6.6	-4.5 (-6.0, -2.9)	-4.0 (-5.2, -2.3)	.03 (.01, .06)	.92 (.385)
STATION 2(25)	4.2	12.2	-8.0 (-10.2, -5.7)	-6.1 (-8.2, -5.0)	.01 (.01, .03)	1.00 (.385)
STATION 3(25)	3.9	12.6	-8.7 (-12.0, -5.4)	-6.6 (-11.6, -2.7)	.02 (.01, .04)	.80 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	3.9	17.2	-13.4 (-15.9, -10.8)	-12.4 (-13.3, -10.3)	.01 (.00, .02)	1.00 (.385)
2.0 TO 4.0(25)	3.8	4.1	-.3 (-1.0, .3)	-.3 (-.8, .4)	.47 (.21, 1.07)	.28 (.385)
> 4.0 M/SEC(14)	3.8	2.4	1.4 (.4, 2.5)	2.2 (.7, 2.6)	.76 (.24, 2.35)	-.71 (.514)
B. STABILITY GROUP						
CLASS UNST (11)	3.6	6.5	-2.9 (-6.3, .5)	-1.3 (-2.6, .0)	.04 (.01, .16)	.45 (.580)
CLASS NEUT (25)	4.6	15.7	-11.2 (-14.2, -8.2)	-10.5 (-12.2, -6.6)	.01 (.01, .03)	1.00 (.385)
CLASS STAB (14)	2.0	7.7	-5.7 (-8.4, -2.9)	-6.5 (-8.9, -1.7)	.01 (.00, .02)	.93 (.514)
C. BY WND/RD ANG						
<20. DEGREES(15)	4.0	18.5	-14.5 (-17.6, -11.4)	-12.7 (-15.9, -11.1)	.03 (.01, .08)	1.00 (.497)
20. TO 60.(25)	3.8	8.3	-4.5 (-7.1, -1.8)	-1.6 (-4.5, -1.2)	.01 (.00, .01)	.72 (.385)
>60. DEGREES(25)	3.8	5.2	-1.5 (-3.0, .1)	-.4 (-1.1, .2)	.10 (.04, .22)	.32 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A15
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPPED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	4.7	42.0	-37.3 (-49.9, -24.7)	-27.3 (-36.5, -21.3)	.00 (.00, .00)	1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	2.2	21.4	-19.2 (-27.9, -10.5)	-9.6 (-20.0, -8.0)	.00 (.00, .00)	1.00 (.385)
STATION 2(25)	4.2	29.3	-25.1 (-35.1, -15.0)	-19.7 (-27.4, -11.6)	.00 (.00, .00)	1.00 (.385)
STATION 3(25)	3.9	26.7	-22.7 (-34.4, -11.1)	-17.9 (-22.4, -6.9)	.00 (.00, .00)	1.00 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	3.9	42.0	-38.1 (-50.7, -25.5)	-27.9 (-37.0, -22.2)	.00 (.00, .00)	1.00 (.385)
2.0 TO 4.0(25)	3.8	5.7	-1.9 (-2.8, -1.0)	-2.1 (-2.6, -.7)	.24 (.10, .53)	.60 (.385)
> 4.0 M/SEC(14)	3.8	3.3	.6 (-.8, 1.9)	1.6 (.0, 2.0)	.36 (.11, 1.11)	-.43 (.514)
B. STABILITY GROUP						
CLASS UNST (11)	3.6	10.0	-6.4 (-12.8, -.1)	-2.4 (-5.4, -1.3)	.01 (.00, .04)	.82 (.580)
CLASS NEUT (25)	4.6	35.6	-31.0 (-44.9, -17.1)	-19.5 (-30.7, -11.1)	.00 (.00, .00)	1.00 (.385)
CLASS STAB (14)	2.0	19.4	-17.3 (-25.5, -9.2)	-19.7 (-23.0, -5.6)	.00 (.00, .00)	1.00 (.514)
C. BY WND/RD ANG						
<20. DEGREES(15)	4.0	42.3	-38.4 (-55.3, -21.4)	-27.8 (-42.2, -22.2)	.00 (.00, .00)	1.00 (.497)
20. TO 60.(25)	3.8	18.4	-14.6 (-25.3, -3.9)	-4.1 (-7.3, -2.8)	.00 (.00, .00)	1.00 (.385)
>60. DEGREES(25)	3.8	9.7	-5.9 (-9.7, -2.2)	-2.7 (-4.2, -1.8)	.02 (.01, .04)	.76 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A16
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	4.7	13.4	-8.7 (-11.7, -5.6)	-7.0 (-8.1, -5.0)	.01 (.00, .02)	1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	2.2	7.2	-5.0 (-7.4, -2.5)	-3.1 (-4.6, -2.4)	.01 (.00, .02)	.92 (.385)
STATION 2(25)	4.2	10.0	-5.8 (-8.7, -2.9)	-4.6 (-5.4, -2.7)	.01 (.00, .02)	.96 (.385)
STATION 3(25)	3.9	9.6	-5.7 (-8.1, -3.2)	-4.9 (-6.6, -2.4)	.03 (.01, .07)	.84 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	3.9	13.4	-9.5 (-12.6, -6.4)	-7.6 (-9.0, -6.1)	.01 (.00, .02)	1.00 (.385)
2.0 TO 4.0(25)	3.8	4.5	-.7 (-1.4, -.1)	-1.0 (-1.2, -.1)	.51 (.23, 1.17)	.40 (.385)
> 4.0 M/SEC(14)	3.8	2.7	1.1 (.1, 2.2)	1.8 (.5, 2.3)	.78 (.25, 2.44)	-.57 (.514)
B. STABILITY GROUP						
CLASS UNST (11)	3.6	5.1	-1.5 (-3.2, .2)	-1.3 (-2.3, .0)	.19 (.05, .70)	.45 (.580)
CLASS NEUT (25)	4.6	13.0	-8.4 (-11.6, -5.3)	-6.3 (-8.3, -4.8)	.01 (.00, .03)	1.00 (.385)
CLASS STAB (14)	2.0	5.4	-3.4 (-5.0, -1.7)	-3.0 (-3.0, -1.8)	.02 (.01, .06)	1.00 (.514)
C. BY WND/RD ANG						
<20. DEGREES(15)	4.0	10.4	-6.4 (-8.0, -4.9)	-5.4 (-8.3, -4.6)	.11 (.04, .33)	1.00 (.497)
20. TO 60.(25)	3.8	6.2	-2.3 (-3.4, -1.2)	-1.1 (-2.9, -.6)	.04 (.02, .09)	.60 (.385)
>60. DEGREES(25)	3.8	9.3	-5.6 (-9.3, -1.8)	-2.3 (-3.7, -1.3)	.02 (.01, .04)	.60 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A17
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	10.8	1.5	9.4 (8.7, 10.0)	9.2 (8.4, 9.8)	24.67 (10.87,55.99)	-1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	3.2	.3	2.9 (2.4, 3.3)	2.4 (2.3, 2.6)	13.53 (5.96, 30.71)	-1.00 (.385)
STATION 2(25)	3.3	.5	2.8 (2.3, 3.2)	2.4 (2.1, 2.7)	11.94 (5.26, 27.09)	-1.00 (.385)
STATION 3(25)	9.2	1.3	7.9 (7.3, 8.5)	7.6 (7.1, 8.3)	20.90 (9.21, 47.44)	-1.00 (.385)
STATION 4(25)	8.9	1.3	7.6 (7.2, 8.0)	7.7 (7.1, 7.9)	7.66 (3.37, 17.37)	-1.00 (.385)
STATION 5(25)	5.9	.5	5.4 (4.5, 6.3)	4.7 (4.2, 4.9)	48.75 (21.48,110.62)	-1.00 (.385)
STATION 6(25)	6.7	.3	6.3 (5.0, 7.7)	4.7 (4.0, 6.7)	***** (48.10,247.67)	-1.00 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	10.6	1.5	9.1 (8.4, 9.9)	8.7 (8.1, 9.7)	29.05 (12.80, 65.91)	-1.00 (.385)
2.0 TO 4.0(25)	7.5	.9	6.6 (6.1, 7.1)	6.1 (5.9, 6.5)	16.25 (7.16, 36.88)	-1.00 (.385)
> 4.0 M/SEC(16)	6.0	.5	5.5 (5.0, 6.0)	5.3 (5.1, 5.5)	8.84 (3.09, 25.31)	-1.00 (.481)
B. STABILITY GROUP						
CLASS UNST (25)	10.7	1.4	9.3 (8.6, 10.0)	8.9 (8.2, 9.7)	25.86 (11.40, 58.68)	-1.00 (.385)
CLASS NEUT (10)	6.2	.9	5.3 (3.7, 6.9)	4.5 (4.0, 6.2)	37.05 (9.20,149.18)	-1.00 (.608)
CLASS STAB (3)	5.3	1.1	4.2 (3.1, 5.3)	4.3 (.0, 3.5)	3.23 (.08,126.10)	-1.00 (1.110)
C. BY WND/RD ANG						
<20. DEGREES(25)	9.4	1.3	8.1 (7.6, 8.7)	8.1 (7.4, 8.5)	20.07 (8.84, 45.54)	-1.00 (.385)
20. TO 60.(25)	8.4	1.1	7.3 (6.7, 7.9)	6.9 (6.5, 7.3)	22.04 (9.71, 50.01)	-1.00 (.385)
>60. DEGREES(13)	10.0	1.2	8.8 (7.4, 10.2)	8.0 (7.1, 9.8)	28.00 (8.54, 91.76)	-1.00 (.533)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A18
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	10.8	3.3	7.5 (6.5, 8.5)	7.8 (6.9, 8.3)	.69 (.31, 1.57)	-.96 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	3.2	.6	2.6 (2.1, 3.1)	2.2 (2.1, 2.4)	8.95 (3.95, 20.32)	-1.00 (.385)
STATION 2(25)	3.3	.9	2.4 (1.9, 2.9)	2.3 (1.9, 2.5)	4.62 (2.04, 10.49)	-1.00 (.385)
STATION 3(25)	9.2	2.8	6.5 (5.6, 7.3)	6.7 (5.8, 7.1)	.84 (.37, 1.90)	-.96 (.385)
STATION 4(25)	8.9	2.9	6.0 (5.2, 6.8)	6.4 (5.8, 6.8)	.26 (.11, .58)	-.96 (.385)
STATION 5(25)	5.9	.8	5.2 (4.2, 6.1)	4.7 (4.0, 4.9)	15.87 (6.99, 36.01)	-1.00 (.385)
STATION 6(25)	6.7	.5	6.1 (4.8, 7.5)	4.6 (3.9, 6.6)	91.16 (40.17,206.86)	-1.00 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	10.6	3.3	7.3 (6.2, 8.3)	7.3 (6.6, 8.0)	.82 (.36, 1.85)	-.96 (.385)
2.0 TO 4.0(25)	7.5	.9	6.6 (6.1, 7.1)	6.2 (6.0, 6.5)	16.25 (7.16, 36.88)	-1.00 (.385)
> 4.0 M/SEC(16)	6.0	.6	5.5 (5.0, 6.0)	5.2 (5.0, 5.4)	8.84 (3.09, 25.31)	-1.00 (.481)
B. STABILITY GROUP						
CLASS UNST (25)	10.7	2.4	8.3 (7.6, 9.0)	8.1 (7.4, 8.8)	3.86 (1.70, 8.77)	-1.00 (.385)
CLASS NEUT (10)	6.2	2.0	4.2 (2.4, 6.1)	4.1 (3.0, 5.3)	1.60 (.40, 6.44)	-.90 (.608)
CLASS STAB (3)	5.3	6.5	-1.1 (-10.4, 8.1)	.1 (.0, .7)	.02 (.00, .85)	-.33 (1.110)
C. BY WND/RD ANG						
<20. DEGREES(25)	9.4	3.2	6.2 (5.2, 7.2)	7.2 (5.8, 7.2)	.52 (.23, 1.18)	-.96 (.385)
20. TO 60.(25)	8.4	1.4	7.0 (6.4, 7.7)	6.8 (6.4, 7.1)	5.47 (2.41, 12.41)	-1.00 (.385)
>60. DEGREES(13)	10.0	1.2	8.8 (7.4, 10.2)	8.1 (7.1, 9.8)	21.36 (6.52, 70.00)	-1.00 (.533)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A19
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	10.8	12.5	-1.7 (-5.2, 1.9)	1.6 (-1.5, 2.8)	.03 (.02, .08)	-.52 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	3.2	2.8	.4 (-.9, 1.7)	1.1 (.7, 1.5)	.15 (.06, .33)	-.68 (.385)
STATION 2(25)	3.3	4.3	-1.0 (-2.7, .7)	-.4 (-1.0, .9)	.07 (.03, .17)	-.28 (.385)
STATION 3(25)	9.2	9.2	.0 (-2.9, 2.8)	.6 (-.6, 4.3)	.04 (.02, .10)	-.48 (.385)
STATION 4(25)	8.9	8.4	.5 (-3.0, 3.9)	3.9 (1.0, 4.6)	.01 (.01, .03)	-.64 (.385)
STATION 5(25)	5.9	3.9	2.0 (.5, 3.6)	2.5 (1.7, 3.1)	.50 (.22, 1.14)	-.68 (.385)
STATION 6(25)	6.7	2.4	4.3 (2.8, 5.8)	3.3 (2.7, 5.0)	4.05 (1.78, 9.19)	-.84 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	10.6	12.5	-1.9 (-5.5, 1.7)	1.1 (-1.7, 2.6)	.04 (.02, .09)	-.40 (.385)
2.0 TO 4.0(25)	7.5	1.3	6.2 (5.7, 6.8)	6.0 (5.6, 6.1)	10.13 (4.46, 22.99)	-1.00 (.385)
> 4.0 M/SEC(16)	6.0	.7	5.4 (4.9, 5.9)	5.2 (5.0, 5.4)	8.84 (3.09, 25.31)	-1.00 (.481)
B. STABILITY GROUP						
CLASS UNST (25)	10.7	7.6	3.2 (1.1, 5.2)	3.6 (2.2, 5.7)	.12 (.05, .26)	-.76 (.385)
CLASS NEUT (10)	6.2	7.0	-.8 (-6.9, 5.4)	1.9 (-6.5, 4.1)	.07 (.02, .27)	-.70 (.608)
CLASS STAB (3)	5.3	26.5	-21.1 (-55.6, 13.3)	-17.7 (.0, -13.6)	.00 (.00, .07)	1.00 (1.110)
C. BY WND/RD ANG						
<20. DEGREES(25)	9.4	11.7	-2.2 (-6.0, 1.5)	1.0 (-2.8, 3.0)	.02 (.01, .06)	-.40 (.385)
20. TO 60.(25)	8.4	3.1	5.3 (4.1, 6.6)	6.3 (5.0, 6.6)	.29 (.13, .67)	-.84 (.385)
>60. DEGREES(13)	10.0	2.2	7.8 (6.3, 9.3)	7.0 (6.3, 9.2)	3.81 (1.16, 12.47)	-1.00 (.533)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A20
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	10.8	2.9	7.9 (7.3, 8.6)	8.0 (7.0, 8.5)	5.32 (2.34,12.06)	-1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	3.2	.7	2.5 (2.0, 2.9)	2.0 (1.9, 2.3)	13.53 (5.96, 30.71)	-1.00 (.385)
STATION 2(25)	3.3	1.1	2.2 (1.8, 2.7)	1.8 (1.6, 2.2)	11.94 (5.26, 27.09)	-1.00 (.385)
STATION 3(25)	9.2	2.3	6.9 (6.3, 7.5)	6.4 (6.0, 7.2)	16.51 (7.27, 37.46)	-1.00 (.385)
STATION 4(25)	8.9	2.5	6.4 (5.9, 6.9)	6.7 (6.0, 6.9)	1.07 (.47, 2.42)	-1.00 (.385)
STATION 5(25)	5.9	1.3	4.6 (3.6, 5.5)	4.1 (3.5, 4.4)	11.54 (5.09, 26.19)	-1.00 (.385)
STATION 6(25)	6.7	.9	5.8 (4.4, 7.1)	4.3 (3.6, 6.3)	50.23 (22.13,113.98)	-1.00 (.385)
3. BY METEOROLOGICAL CONDITION						
A. WIND SPEED						
< 2.0 M/SEC(25)	10.6	2.9	7.7 (7.0, 8.5)	7.5 (6.7, 8.3)	6.26 (2.76, 14.20)	-1.00 (.385)
2.0 TO 4.0(25)	7.5	1.2	6.3 (5.8, 6.9)	6.0 (5.8, 6.3)	12.69 (5.59, 28.81)	-1.00 (.385)
> 4.0 M/SEC(16)	6.0	.5	5.5 (5.1, 6.0)	5.3 (5.1, 5.5)	8.84 (3.09, 25.31)	-1.00 (.481)
B. STABILITY GROUP						
CLASS UNST (25)	10.7	2.8	8.0 (7.3, 8.7)	7.6 (7.1, 8.5)	5.24 (2.31, 11.89)	-1.00 (.385)
CLASS NEUT (10)	6.2	1.7	4.6 (2.9, 6.2)	4.0 (3.0, 5.4)	5.05 (1.25, 20.31)	-1.00 (.608)
CLASS STAB (3)	5.3	2.4	2.9 (1.6, 4.2)	3.1 (.0, 2.4)	.98 (.03, 38.12)	-1.00 (1.110)
C. BY WND/RD ANG						
<20. DEGREES(25)	9.4	2.3	7.1 (6.5, 7.7)	7.0 (6.3, 7.5)	19.48 (8.58, 44.20)	-1.00 (.385)
20. TO 60.(25)	8.4	1.6	6.8 (6.1, 7.4)	6.5 (6.1, 6.9)	5.19 (2.29, 11.78)	-1.00 (.385)
>60. DEGREES(13)	10.8	2.6	7.4 (5.9, 9.0)	6.3 (5.9, 8.7)	2.78 (.85, 9.12)	-1.00 (.533)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A21
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(7)	3.1	3.9	-.8 (-1.7, .0)	-1.2 (-1.8, .0)	.41 (.07, 2.39)	.57 (.727)
2. BY STATION/ALL EVENTS						
STATION 1(7)	1.0	1.8	-.7 (-1.2, -.3)	-.9 (-1.2, -.3)	.27 (.05, 1.57)	.86 (.727)
STATION 2(7)	2.6	3.4	-.8 (-1.8, .2)	-.4 (-2.0, .3)	.20 (.03, 1.17)	.43 (.727)
STATION 3(7)	2.6	2.6	.1 (-1.1, 1.2)	.2 (-1.3, 1.1)	.47 (.08, 2.71)	-.43 (.727)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A22
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(7)	3.1	6.4	-3.3 (-5.0, -1.7)	-3.2 (-5.3, -1.7)	.09 (.02, .52)	1.00 (.727)
2. BY STATION/ALL EVENTS						
STATION 1(7)	1.0	3.4	-2.4 (-3.6, -1.1)	-1.8 (-3.0, -1.4)	.03 (.00, .16)	1.00 (.727)
STATION 2(7)	2.6	6.0	-3.4 (-5.4, -1.3)	-2.9 (-5.9, -1.3)	.05 (.01, .27)	.86 (.727)
STATION 3(7)	2.6	3.8	-1.1 (-2.8, .6)	-.5 (-3.5, .4)	.18 (.03, 1.04)	.43 (.727)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A23
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(7)	3.1	13.9	-10.8 (-19.3, -2.4)	-7.3 (-21.8, -3.5)	.00 (.00, .02)	1.00 (.727)
2. BY STATION/ALL EVENTS						
STATION 1(7)	1.0	10.0	-8.9 (-15.2, -2.6)	-6.5 (-17.8, -3.9)	.00 (.00, .01)	1.00 (.727)
STATION 2(7)	2.6	13.1	-10.6 (-19.6, -1.6)	-7.0 (-22.3, -3.0)	.00 (.00, .01)	1.00 (.727)
STATION 3(7)	2.6	8.3	-5.7 (-13.3, 1.9)	-2.3 (-8.0, -1.0)	.01 (.00, .05)	.86 (.727)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A24
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(7)	3.1	7.0	-3.9 (-6.7, -1.2)	-3.1 (-7.4, -1.4)	.03 (.01, .19)	.86 (.727)
2. BY STATION/ALL EVENTS						
STATION 1(7)	1.0	4.3	-3.3 (-5.5, -1.1)	-3.0 (-4.3, -1.5)	.01 (.00, .05)	1.00 (.727)
STATION 2(7)	2.6	5.9	-3.4 (-6.1, -.7)	-2.6 (-4.9, -1.1)	.03 (.00, .16)	1.00 (.727)
STATION 3(7)	2.6	4.0	-1.3 (-3.9, 1.2)	-.3 (-2.2, .2)	.07 (.01, .43)	.57 (.727)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A25
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	5.6	.7	4.8 (4.6, 5.1)	4.7 (4.6, 4.9)	2.74 (1.21, 6.21)	-1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	1.6	.1	1.5 (1.3, 1.7)	1.4 (1.2, 1.7)	1.71 (.75, 3.89)	-1.00 (.385)
STATION 2(25)	.9	.2	.6 (.5, .8)	.5 (.4, .6)	1.87 (.82, 4.24)	-1.00 (.385)
STATION 3(25)	3.9	.6	3.3 (3.0, 3.6)	3.2 (2.9, 3.5)	4.98 (2.20, 11.30)	-1.00 (.385)
STATION 4(25)	5.5	.6	4.9 (4.7, 5.1)	4.8 (4.7, 5.0)	2.92 (1.29, 6.63)	-1.00 (.385)
STATION 5(25)	3.0	.3	2.7 (2.5, 2.9)	2.7 (2.4, 2.8)	2.04 (.90, 4.63)	-1.00 (.385)
STATION 6(25)	2.2	.2	2.0 (1.8, 2.2)	1.8 (1.7, 2.1)	2.67 (1.17, 6.05)	-1.00 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A26
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	5.6	1.1	4.4 (4.1, 4.8)	4.6 (4.3, 4.8)	.43 (.19, .97)	-1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	1.6	.2	1.5 (1.3, 1.7)	1.4 (1.2, 1.7)	1.71 (.75, 3.89)	-1.00 (.385)
STATION 2(25)	.9	.2	.6 (.4, .8)	.6 (.4, .7)	1.87 (.82, 4.24)	-.92 (.385)
STATION 3(25)	3.9	.9	3.0 (2.6, 3.4)	3.1 (2.7, 3.3)	.81 (.36, 1.84)	-.96 (.385)
STATION 4(25)	5.5	1.0	4.5 (4.1, 4.8)	4.6 (4.3, 4.7)	.69 (.30, 1.56)	-1.00 (.385)
STATION 5(25)	3.0	.2	2.7 (2.5, 2.9)	2.7 (2.4, 2.9)	2.04 (.90, 4.63)	-1.00 (.385)
STATION 6(25)	2.2	.2	2.0 (1.8, 2.2)	1.8 (1.7, 2.1)	2.67 (1.17, 6.05)	-1.00 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A27
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	5.6	2.4	3.1 (1.8, 4.4)	4.2 (3.1, 4.6)	.03 (.01, .06)	-.88 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	1.6	.5	1.1 (.7, 1.6)	1.3 (1.1, 1.5)	.17 (.07, .38)	-.92 (.385)
STATION 2(25)	.9	.8	.0 (-.6, .7)	.4 (.2, .5)	.08 (.04, .19)	-.72 (.385)
STATION 3(25)	3.9	1.9	2.0 (.7, 3.3)	3.0 (2.4, 3.1)	.05 (.02, .12)	-.88 (.385)
STATION 4(25)	5.5	1.9	3.6 (2.8, 4.5)	4.5 (3.6, 4.6)	.08 (.03, .18)	-.92 (.385)
STATION 5(25)	3.0	.8	2.1 (1.8, 2.5)	2.6 (2.1, 2.5)	.35 (.15, .79)	-.96 (.385)
STATION 6(25)	2.2	.5	1.7 (1.4, 1.9)	1.7 (1.5, 1.8)	1.30 (.57, 2.95)	-1.00 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE A28
COMPARISON OF "N" HIGHEST OBSERVED AND PREDICTED
CO CONCENTRATION VALUES (UNPAIRED IN TIME OR LOCATION)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS ("N" OF EVENTS) LESSER OF 25 OR 25%	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	DIFFERENCE OF MEDIANS* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (FOBS-FPRED) (FRACTION)
1. ALL STATIONS/ALL EVENTS(25)	5.6	1.2	4.3 (4.0, 4.7)	4.5 (4.2, 4.6)	.71 (.31, 1.61)	-1.00 (.385)
2. BY STATION/ALL EVENTS						
STATION 1(25)	1.6	.2	1.4 (1.2, 1.6)	1.4 (1.2, 1.6)	1.71 (.75, 3.89)	-1.00 (.385)
STATION 2(25)	.9	.4	.5 (.3, .7)	.5 (.3, .5)	1.87 (.82, 4.24)	-.76 (.385)
STATION 3(25)	3.9	.9	3.0 (2.6, 3.3)	3.1 (2.6, 3.2)	1.51 (.67, 3.43)	-1.00 (.385)
STATION 4(25)	5.5	1.0	4.6 (4.3, 4.8)	4.6 (4.4, 4.7)	1.18 (.52, 2.68)	-1.00 (.385)
STATION 5(25)	3.0	.4	2.5 (2.3, 2.7)	2.5 (2.3, 2.7)	2.04 (.90, 4.63)	-1.00 (.385)
STATION 6(25)	2.2	.3	1.9 (1.7, 2.1)	1.7 (1.6, 2.0)	2.67 (1.17, 6.05)	-1.00 (.385)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

APPENDIX B

STATISTICS FOR VALUES PAIRED IN TIME, INCLUDING HIGH BY EVENT AND PAIRED IN SPACE AND TIME

In the Appendix B tables, model performance statistics are presented for all events with either the predicted or the observed concentration above a threshold value. As in the previous section, each table contains the results for one model, one data base, and one averaging time. In each two page table, results are first presented based on comparisons of the highest observed and predicted concentration values event-by-event, regardless of location. Results are then presented for observed and predicted concentration values paired in time and location, including results for all stations combined, for each individual monitoring station, and for subsets of events based on meteorological conditions. As noted previously, subsets by meteorology were employed only for the 1-hour averaging time.

In establishing the sets of observed and predicted concentration data, a small threshold concentration was used to eliminate events when both the observed and predicted values at a monitoring station were insignificant. The threshold value for 1-hour average carbon monoxide concentrations was 0.5 ppm. No threshold was used for 8-hour average CO concentrations or SF_6 concentrations.

Each table of results is presented in two parts, due to the large number of performance measures recommended for these data sets. Part 1 provides results based on statistics appropriate to unpaired data. Part 2 gives results obtained for the same data sets using statistics appropriate for paired data.

In Part 1, the first column presents the number of events (or data pairs) in each data set. The second and third columns present, respectively, the average observed and average predicted concentration values. The fourth column presents the difference between the observed and predicted averages, followed in parentheses by a 95 percent confidence interval calculated with a two-sample t test. The fifth column (variance comparison) presents the ratio

of the observed variance divided by the predicted variance, with 95 percent confidence bounds in parentheses as calculated with an F test.

The frequency distribution comparison (sixth column) is equivalent to the performance measure previously described in Appendix A. The cumulative frequency distribution of observed values is compared to the distribution of predicted values. The maximum fractional difference is listed; a positive difference implies model overprediction. The value in parentheses is the maximum difference significant at a 95 percent confidence level, as given by the K-S test.

In Part 2, the number of events (i.e., data pairs) is repeated in the first column. The average difference between observed and predicted values is presented in the second column. In parentheses, the 95 percent confidence interval calculated with a one-sample t test is given.

The fraction of positive residuals is presented in the third column. This performance measure indicates the fraction of observed-predicted data pairs for which the observed concentration value is larger than the predicted value. In the fourth column, the standard deviation of the residuals is presented, with 95 percent confidence bounds (from a Chi-Square test) in parentheses. The root mean square error of the residuals (i.e., the square root of the average squared residual) is given next, followed by the average absolute residual.

The Pearson correlation coefficient of observed and predicted concentration values is presented in the seventh column. In parentheses, 95 percent confidence bounds on the correlation coefficient are listed, as calculated with the Fisher z test. The Part 2 tables are also continued on a second page for presentation of meteorological subsets.

TABLE B1. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES# (CO - CP) (PPB)	VARIANCE COMPARISON# (SO##2/SP##2)	FREQUENCY DISTRIBUTION COMPARISON# (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	2.5	2.2	.3 (.0, .5)	.73 (.44, 1.21)	-.32 (.244)
2. ALL PAIRED	433	.9	.7	.2 (.1, .3)	1.15 (.95, 1.39)	-.28 (.092)
3. PAIRED BY STATION,						
STATION 1	62	.3	.3	.0 (-.2, .2)	.76 (.46, 1.26)	-.37 (.244)
STATION 2	62	1.4	.7	.7 (.3, 1.1)	.68 (.41, 1.13)	-.74 (.244)
STATION 3	62	2.0	1.5	.4 (.1, .8)	.95 (.57, 1.57)	-.26 (.244)
STATION 4	61	1.1	1.0	.2 (-.1, .4)	1.13 (.68, 1.88)	-.25 (.246)
STATION 5	62	.7	.6	.1 (-.1, .2)	1.08 (.65, 1.79)	-.16 (.244)
STATION 6	62	.5	.5	.0 (-.1, .1)	1.11 (.67, 1.85)	-.15 (.244)
STATION 7	62	.3	.3	.0 (-.1, .1)	.50 (.30, .83)	-.15 (.244)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	189	.9	.8	.2 (.0, .4)	1.02 (.77, 1.36)	-.32 (.140)
2.0 TO 4.0	244	.9	.6	.2 (.1, .4)	1.32 (1.02, 1.70)	-.25 (.123)
> 4.0 M/SEC	0	.0	.0	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST	203	.8	.6	.2 (.1, .4)	1.33 (1.01, 1.76)	-.28 (.135)
CLASS NEUT	41	.8	.7	.1 (-.3, .5)	1.02 (.54, 1.91)	-.20 (.300)
CLASS STAB	189	1.0	.8	.2 (.0, .4)	1.09 (.82, 1.45)	-.30 (.140)
C. BY WND/RD ANG						
<20. DEGREES	154	1.0	.7	.3 (.1, .5)	1.14 (.83, 1.56)	-.34 (.155)
20. TO 60.	154	.9	.7	.2 (.0, .4)	1.16 (.84, 1.59)	-.26 (.155)
>60. DEGREES	125	.8	.6	.1 (-.1, .3)	1.11 (.78, 1.58)	-.23 (.172)

95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B1. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			CORRELATION COEFFICIENT*
		AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	.3 (.1, .5)	.81	.5(.4, .6)	.6	.5	.77 (.65, .86)
2. ALL PAIRED	433	.2 (.1, .3)	.80	.5(.5, .5)	.5	.3	.84 (.81, .87)
3. PAIRED BY STATION,							
STATION 1	62	.0 (-.1, .1)	.85	.2(.2, .3)	.2	.1	.87 (.79, .92)
STATION 2	62	.7 (.4, 1.1)	.90	.8(.7, 1.0)	1.1	.8	.77 (.64, .85)
STATION 3	62	.4 (.2, .6)	.89	.5(.4, .6)	.7	.5	.87 (.79, .92)
STATION 4	61	.2 (.1, .3)	.85	.3(.3, .4)	.3	.2	.89 (.82, .93)
STATION 5	62	.1 (.0, .2)	.74	.2(.2, .3)	.2	.2	.86 (.78, .92)
STATION 6	62	.0 (.0, .1)	.71	.2(.1, .2)	.2	.1	.87 (.79, .92)
STATION 7	62	.0 (-.1, .1)	.68	.1(.1, .2)	.1	.1	.80 (.69, .87)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	189	.2 (.0, .3)	.78	.5(.4, .5)	.5	.3	.88 (.84, .91)
2.0 TO 4.0	244	.2 (.1, .4)	.82	.5(.5, .6)	.6	.3	.81 (.76, .85)
> 4.0 M/SEC	0	.0 (.0, .0)	.00	.0(.0, .0)	.0	.0	.00 (.00, .00)
B. STABILITY GROUP							
CLASS UNST	203	.2 (.1, .3)	.90	.4(.4, .5)	.5	.3	.85 (.80, .88)
CLASS NEUT	41	.1 (.0, .2)	.68	.4(.3, .5)	.4	.2	.88 (.78, .93)
CLASS STAB	189	.2 (.0, .3)	.73	.6(.5, .6)	.6	.3	.84 (.79, .87)
C. BY WND/RD ANG							
<20. DEGREES	154	.3 (.1, .5)	.69	.7(.6, .7)	.7	.4	.76 (.69, .82)
20. TO 60.	154	.2 (.1, .3)	.87	.4(.4, .5)	.5	.3	.88 (.84, .91)
>60. DEGREES	125	.1 (.1, .2)	.86	.3(.2, .3)	.3	.2	.94 (.92, .96)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B2. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	2.5	2.6	-.1 (-.8, .6)	.05 (.03, .09)	-.39 (.244)
2. ALL PAIRED	433	.9	1.2	-.3 (-.5, -.1)	.25 (.21, .30)	.11 (.092)
3. PAIRED BY STATION,						
STATION 1	62	.3	.9	-.6 (-1.4, .1)	.02 (.01, .04)	.15 (.244)
STATION 2	62	1.4	1.3	.1 (-.5, .7)	.24 (.14, .39)	-.26 (.244)
STATION 3	62	2.0	1.9	.0 (-.5, .5)	.36 (.21, .59)	-.32 (.244)
STATION 4	61	1.1	1.3	-.2 (-.6, .2)	.23 (.14, .39)	-.23 (.246)
STATION 5	62	.7	1.1	-.4 (-.7, .0)	.15 (.09, .25)	.26 (.244)
STATION 6	62	.5	.9	-.4 (-.7, -.1)	.11 (.07, .18)	.29 (.244)
STATION 7	62	.3	.7	-.4 (-.7, -.2)	.05 (.03, .08)	.27 (.244)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	189	.9	1.7	-.8 (-1.1, -.4)	.16 (.12, .21)	.22 (.140)
2.0 TO 4.0	244	.9	.7	.1 (-.1, .3)	.86 (.67, 1.10)	-.13 (.123)
> 4.0 M/SEC	0	.0	.0	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST	203	.8	.6	.2 (.1, .4)	1.84 (1.40, 2.43)	-.17 (.135)
CLASS NEUT	41	.8	2.4	-1.6 (-3.1, -.1)	.03 (.02, .06)	.17 (.300)
CLASS STAB	189	1.0	1.5	-.5 (-.7, -.3)	.73 (.55, .97)	.25 (.140)
C. BY WND/RD ANG						
<20. DEGREES	154	1.0	1.6	-.6 (-1.0, -.1)	.13 (.10, .18)	.10 (.155)
20. TO 60.	154	.9	1.1	-.2 (-.4, .0)	.83 (.60, 1.14)	.14 (.155)
>60. DEGREES	125	.8	.8	.0 (-.2, .2)	.80 (.56, 1.14)	.10 (.172)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B2. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	-.1 (-.8, .6)	.73	2.5(2.1, 3.1)	2.5	1.0	.53 (.33, .69)
2. ALL PAIRED	433	-.3 (-.5, -.1)	.58	1.6(1.5, 1.8)	1.7	.7	.41 (.33, .49)
3. PAIRED BY STATION,							
STATION 1	62	-.6 (-1.4, .1)	.58	2.7(2.3, 3.3)	2.8	.7	.56 (.36, .71)
STATION 2	62	.1 (-.4, .6)	.76	1.8(1.5, 2.2)	1.8	.8	.60 (.41, .74)
STATION 3	62	.0 (-.5, .5)	.71	1.6(1.3, 1.9)	1.6	.9	.42 (.19, .61)
STATION 4	61	-.2 (-.7, .3)	.57	1.5(1.3, 1.8)	1.5	.8	.08 (-.18, .32)
STATION 5	62	-.4 (-.7, .0)	.58	1.2(1.1, 1.5)	1.3	.7	.08 (-.17, .32)
STATION 6	62	-.4 (-.7, -.1)	.48	1.0(.9, 1.3)	1.1	.6	.21 (-.05, .43)
STATION 7	62	-.4 (-.8, - 1)	.40	.9(.8, 1.1)	1.0	.5	.54 (.33, .69)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	189	-.8 (-1.1, -.4)	.41	2.3(2.1, 2.6)	2.4	1.1	.28 (.15, .41)
2.0 TO 4.0	244	.1 (.0, .2)	.72	.5(.5, .6)	.5	.4	.82 (.77, .86)
> 4.0 M/SEC	0	.0 (.0, .0)	.00	.0(.0, .0)	.0	.0	.00 (.00, .00)
B. STABILITY GROUP							
CLASS UNST	203	.2 (.1, .3)	.78	.4(.4, .5)	.5	.3	.84 (.79, .88)
CLASS NEUT	41	-1.6 (-2.8, -.4)	.63	4.5(3.7, 5.8)	4.7	1.9	.35 (.05, .60)
CLASS STAB	189	-.5 (-.7, -.3)	.36	1.0(.9, 1.1)	1.1	.8	.63 (.53, .71)
C. BY WND/RD ANG							
<20. DEGREES	154	-.6 (-1.0, -.2)	.42	2.5(2.2, 2.8)	2.5	.9	.39 (.25, .52)
20. TO 60.	154	-.2 (-.4, .0)	.60	.9(.9, 1.1)	1.0	.7	.49 (.36, .60)
>60. DEGREES	125	.0 (-.2, .2)	.78	.8(.7, .9)	.7	.5	.59 (.47, .70)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B3. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	2.5	2.7	-.2 (-.7, .3)	.13 (.08, .22)	-.37 (.244)
2. ALL PAIRED	433	.9	1.2	-.3 (-.5, -.2)	.40 (.33, .48)	-.09 (.092)
3. PAIRED BY STATION,						
STATION 1	62	.3	.4	-.2 (-.4, .0)	.34 (.21, .57)	-.16 (.244)
STATION 2	62	1.4	1.3	.1 (-.4, .6)	.46 (.27, .76)	-.21 (.244)
STATION 3	62	2.0	2.2	-.2 (-.8, .3)	.27 (.17, .45)	-.24 (.244)
STATION 4	61	1.1	1.7	.6 (-1.0, -.2)	.18 (.11, .31)	.26 (.246)
STATION 5	62	.7	1.3	-.6 (-.9, -.2)	.15 (.09, .24)	.31 (.244)
STATION 6	62	.5	1.0	-.5 (-.8, -.2)	.13 (.08, .22)	.29 (.244)
STATION 7	62	.3	.6	-.4 (-.5, -.2)	.11 (.07, .19)	.37 (.244)
4 BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	189	.9	1.2	-.2 (-.5, .0)	.57 (.43, .75)	-.13 (.140)
2.0 TO 4.0	244	.9	1.3	-.4 (-.6, -.2)	.31 (.24, .40)	.11 (.123)
> 4.0 M/SEC	0	.0	.0	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST	203	.8	.8	.0 (-.2, .1)	1.05 (.80, 1.39)	.08 (.135)
CLASS NEUT	41	.8	1.2	-.4 (-.8, .1)	.49 (.26, .92)	.24 (.300)
CLASS STAB	189	1.0	1.7	-.7 (-1.0, -.4)	.31 (.23, .41)	.20 (.140)
C. BY WND/RD ANG						
<20. DEGREES	154	1.0	1.9	-.9 (-1.3, -.6)	.28 (.21, .39)	.23 (.155)
20. TO 60.	154	.9	1.0	-.1 (-.3, .1)	.72 (.52, .99)	-.11 (.155)
>60. DEGREES	125	.8	.7	.1 (-.1, .3)	1.33 (.94, 1.90)	-.21 (.172)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B3. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	-.2 (-.9, .5)	.65	1.4(1.2, 1.7)	1.4	1.0	.70 (.55, .81)
2. ALL PAIRED	433	-.3 (-.5, -.2)	.49	1.0(1.0, 1.1)	1.1	.6	.70 (.65, .75)
3. PAIRED BY STATION,							
STATION 1	62	-.2 (-.3, .0)	.56	.5(.4, .6)	.5	.2	.73 (.59, .83)
STATION 2	62	.1 (-.4, .6)	.73	1.0(.9, 1.2)	1.0	.7	.77 (.65, .86)
STATION 3	62	-.2 (-.8, .4)	.60	1.3(1.1, 1.6)	1.3	.9	.76 (.63, .85)
STATION 4	61	-.6 (-1.1, -.1)	.43	1.3(1.1, 1.6)	1.4	.8	.60 (.41, .74)
STATION 5	62	-.6 (-1.0, -.2)	.42	1.1(.9, 1.3)	1.2	.7	.50 (.29, .67)
STATION 6	62	-.5 (-.8, -.2)	.37	.8(.7, 1.0)	1.0	.6	.52 (.31, .68)
STATION 7	62	-.4 (-.6, -.2)	.32	.6(.5, .8)	.7	.4	.37 (.13, .56)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	189	-.2 (-.5, .0)	.55	1.0(.9, 1.1)	1.0	.6	.66 (.57, .73)
2.0 TO 4.0	244	-.4 (-.6, -.2)	.44	1.0(1.0, 1.2)	1.1	.6	.75 (.69, .80)
> 4.0 M/SEC	0	.0 (.0, .0)	.00	.0(.0, .0)	.0	.0	.00 (.00, .00)
B. STABILITY GROUP							
CLASS UNST	203	.0 (-.1, .1)	.52	.4(.4, .5)	.4	.3	.85 (.81, .88)
CLASS NEUT	41	-.4 (-.6, -.2)	.37	.7(.6, .9)	.8	.5	.81 (.67, .90)
CLASS STAB	189	-.7 (-1.0, -.3)	.48	1.4(1.2, 1.5)	1.5	1.0	.68 (.59, .75)
C. BY WND/RD ANG							
<20. DEGREES	154	-.9 (-1.2, -.')	.16	1.2(1.1, 1.4)	1.6	1.1	.77 (.70, .83)
20. TO 60.	154	-.1 (-.3, .1)	.62	.8(.7, .9)	.8	.5	.67 (.58, .75)
>60. DEGREES	125	.1 (.0, .3)	.73	.4(.3, .4)	.4	.3	.87 (.81, .90)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B4. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	2.5	2.3	.2 (.0, .5)	.60 (.36, .99)	-.29 (.244)
2. ALL PAIRED	433	.9	.9	.0 (-.2, .1)	.94 (.78, 1.13)	-.11 (.092)
3. PAIRED BY STATION,						
STATION 1	62	.3	.5	-.2 (-.5, .0)	.28 (.17, .47)	-.13 (.244)
STATION 2	62	1.4	1.1	.3 (-.1, .7)	.74 (.44, 1.22)	-.24 (.244)
STATION 3	62	2.0	1.7	.2 (-.1, .6)	.95 (.57, 1.57)	-.19 (.244)
STATION 4	61	1.1	1.3	-.1 (-.4, .1)	.66 (.39, 1.10)	.18 (.246)
STATION 5	62	.7	.9	-.2 (-.4, .0)	.52 (.32, .87)	.23 (.244)
STATION 6	62	.5	.7	-.2 (-.3, .0)	.48 (.29, .80)	.26 (.244)
STATION 7	62	.3	.4	-.1 (-.2, .0)	.46 (.28, .76)	.29 (.244)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	189	.9	1.0	-.1 (-.3, .1)	.78 (.59, 1.05)	-.17 (.140)
2.0 TO 4.0	244	.9	.8	.0 (-.1, .2)	1.17 (.91, 1.51)	-.07 (.123)
> 4.0 M/SEC	0	.0	.0	.0 (.0, .0)	.00 (.00, .00)	.00 (.000)
B. STABILITY GROUP						
CLASS UNST	203	.8	.7	.1 (.0, .2)	1.38 (1.05, 1.82)	-.08 (.135)
CLASS NEUT	41	.8	.9	-.1 (-.5, .3)	.82 (.44, 1.53)	.10 (.300)
CLASS STAB	189	1.0	1.2	-.2 (-.4, .0)	.86 (.64, 1.14)	-.15 (.140)
C. BY WND/RD ANG						
<20. DEGREES	154	1.0	1.2	-.2 (-.4, .1)	1.07 (.78, 1.47)	.18 (.155)
20. TO 60.	154	.9	.9	.0 (-.2, .2)	.91 (.66, 1.25)	-.13 (.155)
>60. DEGREES	125	.8	.7	.0 (-.2, .2)	.87 (.61, 1.24)	-.23 (.172)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B4. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	62	.2 (.1, .4)	.76	.5(.5, .6)	.6	.5	.78 (.65, .86)
2. ALL PAIRED	433	.0 (-.1, .0)	.55	.5(.4, .5)	.5	.3	.87 (.84, .89)
3. PAIRED BY STATION,							
STATION 1	62	-.2 (-.5, .0)	.53	.5(.4, .6)	.6	.2	.83 (.73, .89)
STATION 2	62	.3 (.0, .6)	.76	.6(.5, .7)	.7	.5	.88 (.80, .92)
STATION 3	62	.2 (.1, .4)	.74	.5(.4, .6)	.5	.4	.90 (.84, .94)
STATION 4	61	-.1 (-.3, .0)	.51	.4(.3, .5)	.4	.3	.87 (.79, .92)
STATION 5	62	-.2 (-.3, .0)	.45	.4(.3, .5)	.4	.3	.81 (.70, .88)
STATION 6	62	-.2 (-.3, -.1)	.40	.3(.3, .4)	.3	.2	.81 (.71, .88)
STATION 7	62	-.1 (-.2, .0)	.45	.2(.2, .3)	.3	.2	.70 (.55, .81)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	189	-.1 (-.3, .1)	.53	.6(.5, .6)	.6	.4	.85 (.81, .89)
2.0 TO 4.0	244	.0 (-.1, .1)	.56	.4(.4, .4)	.4	.3	.89 (.86, .92)
> 4.0 M/SEC	0	.0 (.0, .0)	.00	.0(.0, .0)	.0	.0	.00 (.00, .00)
B. STABILITY GROUP							
CLASS UNST	203	.1 (.0, .2)	.66	.3(.3, .3)	.3	.2	.93 (.90, .94)
CLASS NEUT	41	-.1 (-.2, .0)	.46	.3(.3, .4)	.3	.2	.94 (.89, .97)
CLASS STAB	189	-.2 (-.3, .0)	.45	.6(.5, .7)	.6	.4	.84 (.79, .88)
C. BY WND/RD ANG							
<20. DEGREES	154	-.2 (-.3, -.1)	.25	.5(.4, .5)	.5	.4	.89 (.85, .92)
20. TO 60.	154	.0 (-.1, .2)	.70	.5(.5, .6)	.5	.3	.83 (.77, .87)
>60. DEGREES	125	.0 (-.1, .1)	.74	.4(.3, .4)	.4	.2	.90 (.86, .93)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

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TABLE B5. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	5.6	5.1	.5 (-1.1, 2.2)	.64 (.26, 1.58)	-.24 (.420)
2. ALL PAIRED	150	2.1	1.6	.5 (.0, 1.0)	1.02 (.74, 1.41)	-.33 (.157)
3. PAIRED BY STATION,						
STATION 1	17	1.6	1.1	.5 (-.7, 1.6)	3.22 (1.16, 8.88)	-.24 (.466)
STATION 2	16	2.0	1.5	.5 (-.7, 1.7)	1.45 (.51, 4.16)	-.25 (.481)
STATION 3	18	2.3	2.0	.3 (-1.0, 1.6)	.93 (.35, 2.49)	-.28 (.453)
STATION 4	18	4.1	3.5	.6 (-1.6, 2.7)	.82 (.31, 2.20)	-.28 (.453)
STATION 5	20	3.4	2.1	1.2 (-.8, 3.3)	.80 (.31, 2.01)	-.55 (.430)
STATION 6	19	1.4	1.1	.2 (-.7, 1.2)	.80 (.31, 2.09)	-.37 (.441)
STATION 7	21	1.3	1.1	.2 (-.7, 1.1)	.76 (.31, 1.88)	-.33 (.420)
STATION 8	21	1.1	.8	.2 (-.6, 1.1)	1.16 (.47, 2.87)	-.33 (.420)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	43	2.8	2.3	.5 (-.7, 1.7)	1.01 (.55, 1.86)	-.26 (.293)
2.0 TO 4.0	60	2.3	1.7	.6 (-.3, 1.5)	.91 (.54, 1.53)	-.53 (.248)
> 4.0 M/SEC	47	1.3	1.0	.3 (-.2, .8)	1.59 (.89, 2.86)	-.15 (.281)
B. STABILITY GROUP						
CLASS UNST	24	3.1	2.0	1.1 (-.5, 2.6)	1.29 (.56, 2.98)	-.38 (.393)
CLASS NEUT	123	1.8	1.4	.4 (-.1, .9)	1.01 (.71, 1.45)	-.33 (.173)
CLASS STAB	3	6.7	7.6	-.9 (-7.3, 5.5)	.29 (.01,11.48)	.33 (****)
C. BY WND/RD ANG						
<20. DEGREES	21	2.8	1.8	1.0 (-.6, 2.6)	.96 (.39, 2.35)	-.52 (.420)
20. TO 60.	82	2.0	1.4	.6 (-.1, 1.2)	1.13 (.73, 1.76)	-.41 (.212)
>60. DEGREES	47	2.1	2.0	.0 (-.9, 1.0)	.90 (.50, 1.62)	-.11 (.281)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B5. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS						
		BIAS		CHARACTERISTIC DISCREPANCIES				
		AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	.5 (.1, .9)	.67	1.2(1.0, 1.8)	1.3	1.0	.91 (.79, .96)
2. ALL PAIRED	150	.5 (.3, .6)	.80	1.2(1.1, 1.3)	1.3	.7	.87 (.82, .90)
3. PAIRED BY STATION,							
STATION 1	17	.5 (-.1, 1.1)	.76	1.5(1.1, 2.2)	1.5	.7	.71 (.34, .89)
STATION 2	16	.5 (.2, .8)	.75	1.0(.8, 1.6)	1.1	.8	.81 (.52, .93)
STATION 3	18	.3 (.0, .6)	.78	.9(.7, 1.3)	.9	.7	.89 (.72, .96)
STATION 4	18	.6 (.1, 1.0)	.78	1.2(.9, 1.9)	1.3	.9	.93 (.81, .97)
STATION 5	20	1.2 (.4, 2.1)	.85	2.1(1.6, 3.1)	2.4	1.5	.79 (.53, .91)
STATION 6	19	.2 (-.1, .6)	.79	.5(.4, .8)	.6	.4	.93 (.83, .97)
STATION 7	21	.2 (.0, .5)	.81	.5(.4, .7)	.5	.4	.95 (.89, .98)
STATION 8	21	.2 (.1, .4)	.86	.4(.3, .6)	.5	.3	.96 (.90, .98)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	43	.5 (.2, .8)	.77	1.5(1.2, 1.8)	1.5	.8	.86 (.76, .92)
2.0 TO 4.0	60	.6 (.3, .9)	.80	1.3(1.1, 1.6)	1.4	.9	.85 (.77, .91)
> 4.0 M/SEC	47	.3 (.1, .5)	.83	.6(.5, .7)	.7	.4	.89 (.81, .94)
B. STABILITY GROUP							
CLASS UNST	24	1.1 (.5, 1.6)	.92	1.6(1.3, 2.3)	1.9	1.1	.83 (.63, .92)
CLASS NEUT	123	.4 (.2, .6)	.79	1.0(.9, 1.2)	1.1	.6	.87 (.82, .91)
CLASS STAB	3	-.9 (******,5565.1)	.33	1.6(.8, 9.9)	1.6	1.3	.95 (.95, .95)
C. BY WND/RD ANG							
<20. DEGREES	21	1.0 (.0, 1.9)	.90	1.9(1.5, 2.8)	2.1	1.3	.72 (.42, .88)
20. TO 60.	82	.6 (.4, .8)	.80	1.1(.9, 1.3)	1.2	.8	.87 (.81, .92)
>60. DEGREES	47	.0 (-.1, .2)	.74	.6(.5, .8)	.6	.4	.96 (.93, .98)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B6. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	5.6	5.2	.5 (-1.2, 2.2)	.59 (.24, 1.44)	-.29 (.420)
2. ALL PAIRED	150	2.1	1.8	.3 (-.2, .8)	.92 (.67, 1.27)	-.12 (.157)
3. PAIRED BY STATION,						
STATION 1	17	1.6	1.1	.5 (-.6, 1.7)	3.97 (1.44,10.96)	-.24 (.466)
STATION 2	16	2.0	1.5	.6 (-.6, 1.7)	1.89 (.66, 5.40)	-.19 (.481)
STATION 3	18	2.3	1.9	.4 (-.8, 1.6)	1.22 (.46, 3.26)	-.22 (.453)
STATION 4	18	4.1	4.0	.1 (-2.0, 2.2)	.88 (.33, 2.35)	-.28 (.453)
STATION 5	20	3.4	2.7	.7 (-1.2, 2.6)	1.12 (.44, 2.83)	-.30 (.430)
STATION 6	19	1.4	1.0	.3 (-.5, 1.2)	1.16 (.45, 3.01)	-.26 (.441)
STATION 7	21	1.3	1.2	.0 (-1.2, 1.3)	.35 (.14, .85)	-.24 (.420)
STATION 8	21	1.1	1.1	-.1 (-1.3, 1.2)	.29 (.12, .72)	-.33 (.420)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	43	2.8	2.9	.0 (-1.3, 1.2)	.72 (.39, 1.32)	-.12 (.293)
2.0 TO 4.0	60	2.3	1.8	.5 (-.3, 1.2)	1.22 (.73, 2.04)	-.20 (.248)
> 4.0 M/SEC	47	1.3	.8	.5 (.0, .9)	2.42 (1.35, 4.35)	-.28 (.281)
B. STABILITY GROUP						
CLASS UNST	24	3.1	2.8	.3 (-1.4, 2.0)	.93 (.40, 2.15)	-.17 (.393)
CLASS NEUT	123	1.8	1.4	.4 (-.1, .9)	1.28 (.89, 1.83)	-.15 (.173)
CLASS STAB	3	6.7	10.0	-3.4 (-8.1, 1.4)	.53 (.01,20.69)	.67 (****)
C. BY WND/RD ANG						
<20. DEGREES	21	2.8	2.7	.1 (-1.6, 1.8)	.84 (.34, 2.08)	-.10 (.420)
20. TO 60.	82	2.0	1.5	.5 (-.1, 1.1)	1.25 (.81, 1.94)	-.18 (.212)
>60. DEGREES	47	2.1	1.9	.1 (-.9, 1.1)	.68 (.38, 1.22)	-.13 (.281)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B6. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	.5 (-.4, 1.4)	.62	1.7(1.3, 2.4)	1.7	1.4	.84 (.64, .93)
2. ALL PAIRED	150	.3 (.1, .5)	.71	1.3(1.1, 1.4)	1.3	.8	.85 (.80, .89)
3. PAIRED BY STATION,							
STATION 1	17	.5 (-.1, 1.2)	.82	1.5(1.1, 2.2)	1.5	.7	.72 (.37, .89)
STATION 2	16	.6 (.0, 1.1)	.75	1.1(.8, 1.7)	1.2	.9	.77 (.45, .92)
STATION 3	18	.4 (-.1, 1.0)	.72	.9(.7, 1.4)	1.0	.7	.88 (.69, .95)
STATION 4	18	.1 (-1.0, 1.2)	.33	1.5(1.1, 2.2)	1.4	1.0	.89 (.73, .96)
STATION 5	20	.7 (.0, 1.3)	.80	1.3(1.0, 1.9)	1.4	1.1	.90 (.77, .96)
STATION 6	19	.3 (.0, .6)	.84	.7(.5, 1.0)	.8	.6	.86 (.68, .95)
STATION 7	21	.0 (-.5, .6)	.71	1.4(1.1, 2.0)	1.3	.7	.86 (.69, .94)
STATION 8	21	-.1 (-.6, .5)	.71	1.4(1.1, 2.1)	1.4	.7	.90 (.77, .96)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	43	.0 (-.7, .6)	.70	1.9(1.5, 2.4)	1.9	1.0	.82 (.69, .90)
2.0 TO 4.0	60	.5 (.1, .8)	.68	1.0(.9, 1.2)	1.1	.8	.90 (.84, .94)
> 4.0 M/SEC	47	.5 (.3, .7)	.77	.6(.5, .8)	.8	.5	.91 (.84, .95)
B. STABILITY GROUP							
CLASS UNST	24	.3 (-.4, 1.0)	.71	1.8(1.4, 2.6)	1.8	1.2	.80 (.58, .91)
CLASS NEUT	123	.4 (.2, .6)	.72	.8(.7, .9)	.9	.6	.91 (.87, .94)
CLASS STAB	3	-3.4 (******,******)	.33	4.0(2.1,24.8)	4.7	4.2	-.95 (-.95,-.95)
C. BY WND/RD ANG							
<20. DEGREES	21	.1 (-.4, .6)	.48	1.7(1.3, 2.4)	1.6	1.2	.81 (.57, .92)
20. TO 60.	82	.5 (.2, .8)	.70	1.1(.9, 1.2)	1.2	.8	.88 (.82, .92)
>60. DEGREES	47	.1 (-.3, .5)	.85	1.3(1.1, 1.7)	1.3	.6	.87 (.78, .93)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B7. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	5.6	6.1	-.5 (-2.4, 1.4)	.42 (.17, 1.04)	-.19 (.420)
2. ALL PAIRED	150	2.1	2.4	-.2 (-.8, .3)	.63 (.46, .88)	-.19 (.157)
3. PAIRED BY STATION,						
STATION 1	17	1.6	1.9	-.3 (-1.6, 1.1)	1.20 (.43, 3.30)	.41 (.466)
STATION 2	16	2.0	2.5	-.4 (-1.9, 1.0)	.62 (.22, 1.77)	.31 (.481)
STATION 3	18	2.3	3.0	-.7 (-2.3, .9)	.44 (.16, 1.18)	.33 (.453)
STATION 4	18	4.1	4.6	-.6 (-3.2, 2.0)	.46 (.17, 1.23)	.17 (.453)
STATION 5	20	3.4	3.1	.2 (-1.9, 2.3)	.72 (.28, 1.81)	-.25 (.430)
STATION 6	19	1.4	1.6	-.2 (-1.3, .9)	.47 (.18, 1.21)	-.26 (.441)
STATION 7	21	1.3	1.4	-.1 (-1.1, .9)	.62 (.25, 1.54)	-.19 (.420)
STATION 8	21	1.1	1.1	.0 (-.9, .8)	.89 (.36, 2.18)	-.19 (.420)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	43	2.8	3.5	-.7 (-2.1, .7)	.57 (.31, 1.04)	.14 (.293)
2.0 TO 4.0	60	2.3	2.4	-.2 (-1.1, .8)	.69 (.41, 1.16)	-.27 (.248)
> 4.0 M/SEC	47	1.3	1.2	.1 (-.5, .6)	1.13 (.63, 2.04)	-.15 (.281)
B. STABILITY GROUP						
CLASS UNST	24	3.1	3.9	-.9 (-3.0, 1.2)	.46 (.20, 1.07)	-.17 (.393)
CLASS NEUT	123	1.8	2.0	-.1 (-.7, .4)	.73 (.51, 1.04)	-.20 (.173)
CLASS STAB	3	6.7	6.5	.2 (-5.5, 5.8)	.37 (.01,14.43)	-.67 (****)
C. BY WND/RD ANG						
<20. DEGREES	21	2.8	3.8	-1.0 (-3.1, 1.2)	.37 (.15, .92)	.19 (.420)
20. TO 60.	82	2.0	2.1	-.1 (-.9, .6)	.72 (.47, 1.12)	-.28 (.212)
>60. DEGREES	47	2.1	2.2	-.1 (-1.1, .8)	.87 (.48, 1.56)	-.11 (.281)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B7. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	-.5 (-1.6, .6)	.43	2.3(1.8, 3.4)	2.3	1.6	.77 (.50, .90)
2. ALL PAIRED	150	-.2 (-.5, .0)	.63	1.5(1.4, 1.7)	1.5	1.0	.85 (.79, .89)
3. PAIRED BY STATION,							
STATION 1	17	-.3 (-1.1, .5)	.53	1.6(1.2, 2.4)	1.6	1.1	.66 (.26, .87)
STATION 2	16	-.4 (-1.2, .4)	.56	1.6(1.2, 2.4)	1.6	1.2	.71 (.33, .89)
STATION 3	18	-.7 (-1.5, .1)	.50	1.7(1.3, 2.5)	1.8	1.2	.82 (.57, .93)
STATION 4	18	-.6 (-1.9, .8)	.56	2.5(1.9, 3.8)	2.5	1.6	.84 (.62, .94)
STATION 5	20	.2 (-.5, 1.0)	.70	1.6(1.2, 2.4)	1.6	1.1	.89 (.74, .96)
STATION 6	19	-.2 (-.7, .4)	.74	1.0(.8, 1.5)	1.0	.6	.88 (.71, .95)
STATION 7	21	-.1 (-.5, .3)	.67	.9(.7, 1.2)	.8	.5	.88 (.73, .95)
STATION 8	21	.0 (-.5, .4)	.71	.8(.5, 1.2)	.8	.5	.82 (.61, .93)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	43	-.7 (-1.3, -.1)	.47	2.0(1.6, 2.5)	2.1	1.3	.84 (.73, .91)
2.0 TO 4.0	60	-.2 (-.6, .3)	.67	1.5(1.3, 1.9)	1.5	1.1	.83 (.73, .90)
> 4.0 M/SEC	47	.1 (-.2, .3)	.72	.7(.6, .9)	.7	.5	.84 (.73, .91)
B. STABILITY GROUP							
CLASS UNST	24	-.9 (-1.7, -.1)	.42	2.6(2.0, 3.6)	2.7	1.8	.80 (.58, .91)
CLASS NEUT	123	-.1 (-.4, .1)	.67	1.2(1.1, 1.4)	1.2	.8	.86 (.80, .90)
CLASS STAB	3	.2 (#######,4438.1)	.67	1.3(.7, 7.9)	1.0	.9	.96 (.96, .96)
C. BY WND/RD ANG							
<20. DEGREES	21	-1.0 (-1.6, -.3)	.48	2.7(2.1, 3.9)	2.8	2.1	.78 (.52, .90)
20. TO 60.	82	-.1 (-.5, .3)	.66	1.4(1.2, 1.7)	1.4	1.0	.84 (.76, .89)
>60. DEGREES	47	-.1 (-.4, .1)	.64	.7(.6, .9)	.7	.4	.96 (.92, .98)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B8. (PART 1) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPB)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	5.6	6.2	-.6 (-2.4, 1.3)	.45 (.18, 1.12)	-.19 (.420)
2. ALL PAIRED	150	2.1	2.1	.0 (-.6, .6)	.67 (.49, .92)	-.20 (.157)
3. PAIRED BY STATION,						
STATION 1	17	1.6	1.5	.1 (-1.1, 1.4)	1.97 (.71, 5.44)	.24 (.466)
STATION 2	16	2.0	2.0	.0 (-1.3, 1.3)	.94 (.33, 2.70)	.25 (.481)
STATION 3	18	2.3	2.7	-.3 (-1.8, 1.1)	.61 (.23, 1.64)	.28 (.453)
STATION 4	18	4.1	4.5	-.5 (-2.9, 1.9)	.58 (.22, 1.54)	.17 (.453)
STATION 5	20	3.4	3.0	.4 (-1.8, 2.5)	.63 (.25, 1.60)	-.25 (.430)
STATION 6	19	1.4	1.2	.2 (-.8, 1.1)	.76 (.29, 1.98)	-.26 (.441)
STATION 7	21	1.3	1.3	.0 (-1.2, 1.2)	.36 (.15, .89)	-.19 (.420)
STATION 8	21	1.1	1.0	.0 (-1.0, 1.1)	.48 (.20, 1.19)	-.29 (.420)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	43	2.8	3.3	-.4 (-1.8, 1.0)	.58 (.31, 1.07)	-.14 (.293)
2.0 TO 4.0	60	2.3	2.2	.1 (-.8, 1.0)	.75 (.45, 1.25)	-.28 (.248)
> 4.0 M/SEC	47	1.3	1.0	.3 (-.2, .8)	1.54 (.86, 2.77)	-.15 (.281)
B. STABILITY GROUP						
CLASS UNST	24	3.1	3.0	.0 (-1.8, 1.9)	.73 (.32, 1.70)	-.17 (.393)
CLASS NEUT	123	1.8	1.7	.1 (-.4, .6)	.80 (.56, 1.14)	-.21 (.173)
CLASS STAB	3	6.7	11.0	-4.3 (-9.7, 1.0)	.41 (.01,16.06)	1.00 (****)
C. BY WND/RD ANG						
<20. DEGREES	21	2.8	2.8	.0 (-1.8, 1.8)	.65 (.26, 1.61)	-.19 (.420)
20. TO 60.	82	2.0	1.8	.2 (-.6, .9)	.80 (.52, 1.24)	-.29 (.212)
>60. DEGREES	47	2.1	2.4	-.3 (-1.4, .8)	.54 (.30, .96)	-.11 (.281)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B8. (PART 2) COMPARISON OF OBSERVED AND PREDICTED SF6 CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS76 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	21	-.6 (-1.4, .3)	.43	1.8(1.4, 2.6)	1.9	1.5	.87 (.71, .95)
2. ALL PAIRED	150	.0 (-.2, .2)	.67	1.2(1.1, 1.4)	1.2	.8	.90 (.86, .93)
3. PAIRED BY STATION,							
STATION 1	17	.1 (-.4, .6)	.59	1.2(.9, 1.9)	1.2	.7	.80 (.51, .92)
STATION 2	16	.0 (-.4, .5)	.56	1.0(.8, 1.6)	1.0	.8	.84 (.58, .94)
STATION 3	18	-.3 (-.9, .3)	.56	1.2(.9, 1.7)	1.2	.8	.88 (.70, .95)
STATION 4	18	-.5 (-1.4, .4)	.56	1.7(1.3, 2.6)	1.7	1.3	.92 (.79, .97)
STATION 5	20	.4 (-.4, 1.1)	.70	1.7(1.3, 2.5)	1.7	1.1	.90 (.75, .96)
STATION 6	19	.2 (-.2, .5)	.79	.6(.4, .9)	.6	.4	.93 (.82, .97)
STATION 7	21	.0 (-.5, .5)	.76	1.2(.9, 1.7)	1.2	.6	.92 (.80, .97)
STATION 8	21	.0 (-.3, .4)	.76	.8(.6, 1.2)	.8	.5	.95 (.87, .98)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	43	-.4 (-.9, .1)	.4[illegible]	1.6(1.4, 2.1)	1.7	1.0	.90 (.83, .95)
2.0 TO 4.0	60	.1 (-.3, .4)	.6[illegible]	1.2(1.0, 1.5)	1.2	.9	.89 (.83, .94)
> 4.0 M/SEC	47	.3 (.1, .5)	.8[illegible]	.6(.5, .7)	.6	.4	.90 (.82, .94)
B. STABILITY GROUP							
CLASS UNST	24	.1 (-.5, .6)	.50	1.5(1.2, 2.1)	1.5	.9	.89 (.76, .95)
CLASS NEUT	123	.1 (-.1, .3)	.72	1.0(.9, 1.1)	1.0	.6	.90 (.86, .93)
CLASS STAB	3	-4.3 (******,4454.7)	.00	1.3(.7, 8.0)	4.5	4.3	.92 (.92, .92)
C. BY WND/RD ANG							
<20. DEGREES	21	.0 (-.4, .4)	.52	1.6(1.2, 2.4)	1.6	1.1	.86 (.68, .94)
20. TO 60.	82	.2 (-.1, .5)	.72	1.1(.9, 1.3)	1.1	.8	.90 (.84, .93)
>60. DEGREES	47	-.3 (-.6, .0)	.64	1.2(1.0, 1.5)	1.3	.6	.94 (.89, .97)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B9. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	3.8	4.2	-.4 (-1.5, .7)	1.41 (.77, 2.56)	.20 (.287)
2. ALL PAIRED	484	1.8	2.0	-.2 (-.4, .0)	.94 (.78, 1.12)	.13 (.087)
3. PAIRED BY STATION,						
STATION 1/14	37	1.2	1.0	.2 (-.2, .6)	1.86 (.96, 3.61)	-.19 (.316)
STATION 2/13	32	.9	1.1	-.2 (-.5, .2)	.94 (.46, 1.93)	.25 (.340)
STATION 3/12	46	1.3	1.2	.0 (-.4, .5)	1.47 (.81, 2.65)	.17 (.284)
STATION 4/11	41	1.4	1.6	-.3 (-.8, .2)	1.24 (.66, 2.33)	.22 (.300)
STATION 5/10	50	1.9	2.3	-.4 (-1.0, .3)	.69 (.39, 1.22)	.20 (.272)
STATION 6/ 9	62	2.9	3.0	-.1 (-1.0, .9)	.93 (.56, 1.55)	-.29 (.244)
STATION 7/ 8	31	2.4	2.6	-.3 (-1.3, .8)	1.25 (.60, 2.59)	.26 (.345)
STATION 15/21	42	1.5	1.8	-.3 (-.8, .3)	.76 (.41, 1.42)	.26 (.297)
STATION 16/22	43	1.5	1.8	.3 (-.8, .2)	1.33 (.72, 2.45)	.28 (.293)
STATION 17/19	56	2.2	2.8	-.6 (-1.4, .2)	.78 (.46, 1.34)	.27 (.257)
STATION 18/20	44	2.0	2.1	.0 (-.7, .7)	1.15 (.63, 2.11)	-.18 (.290)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	294	1.9	2.2	-.2 (-.6, .1)	.79 (.63, .99)	-.21 (.112)
2.0 TO 4.0	178	1.6	1.8	-.2 (-.5, .1)	1.56 (1.16, 2.10)	.20 (.144)
> 4.0 M/SEC	12	1.8	1.1	.8 (.0, 1.5)	3.68 (1.06,12.77)	-.42 (.555)
B. STABILITY GROUP						
CLASS UNST	262	1.4	1.3	.1 (-.1, .3)	1.14 (.90, 1.46)	-.21 (.119)
CLASS NEUT	130	2.8	3.0	-.2 (-.8, .3)	1.32 (.93, 1.87)	.18 (.169)
CLASS STAB	92	1.6	2.7	-1.1 (-1.6, -.6)	.43 (.29, .65)	.33 (.201)
C. BY WND/RD ANG						
<20. DEGREES	68	1.4	1.3	.1 (-.4, .7)	.88 (.54, 1.42)	-.34 (.233)
20. TO 60.	278	1.6	2.0	-.4 (-.7, -.2)	.88 (.70, 1.12)	.18 (.115)
>60. DEGREES	138	2.5	2.4	.1 (-.4, .6)	.96 (.69, 1.35)	-.16 (.164)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B9. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	-.4 (-1.9, 1.1)	.51	2.5(2.1, 3.2)	2.5	1.9	.53 (.28, .71)
2. ALL PAIRED	484	-.2 (-.4, .0)	.52	1.6(1.5, 1.8)	1.7	1.1	.58 (.51, .63)
3. PAIRED BY STATION,							
STATION 1/14	37	.2 (-.3, .6)	.70	.9(.7, 1.1)	.9	.7	.46 (.16, .68)
STATION 2/13	32	-.2 (-.6, .2)	.47	.7(.6, 1.0)	.7	.5	.53 (.23, .74)
STATION 3/12	46	.0 (-.5, .5)	.48	1.2(1.0, 1.5)	1.2	.8	.37 (.09, .60)
STATION 4/11	41	-.3 (-.8, .3)	.46	1.1(.9, 1.4)	1.1	.8	.56 (.30, .74)
STATION 5/10	50	-.4 (-1.0, .3)	.50	1.5(1.3, 1.9)	1.5	1.1	.57 (.35, .74)
STATION 6/ 9	62	-.1 (-1.2, 1.1)	.61	2.5(2.1, 3.0)	2.4	1.7	.59 (.40, .73)
STATION 7/ 8	31	-.3 (-1.6, 1.0)	.58	2.4(1.9, 3.2)	2.4	1.7	.30 (-.06, .59)
STATION 15/21	42	-.3 (-.7, .1)	.40	1.1(.9, 1.4)	1.1	.9	.61 (.38, .77)
STATION 16/22	43	-.3 (-1.0, .3)	.47	1.3(1.1, 1.6)	1.3	.9	.38 (.09, .61)
STATION 17/19	56	-.6 (-1.5, .3)	.50	2.1(1.7, 2.5)	2.1	1.5	.56 (.35, .72)
STATION 18/20	44	.0 (-.7, .7)	.59	1.6(1.3, 2.1)	1.6	1.2	.52 (.27, .71)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	294	-.2 (-.4, -.1)	.46	1.7(1.6, 1.9)	1.8	1.2	.61 (.53, .67)
2.0 TO 4.0	178	-.2 (-.6, .2)	.60	1.5(1.3, 1.7)	1.5	1.0	.52 (.40, .62)
> 4.0 M/SEC	12	.8 (-.3, 1.8)	1.00	.8(.6, 1.4)	1.1	.8	.65 (.12, .89)
B. STABILITY GROUP							
CLASS UNST	262	.1 (-.1, .3)	.55	1.2(1.2, 1.4)	1.2	.9	.42 (.31, .51)
CLASS NEUT	130	-.2 (-.7, .3)	.62	1.8(1.6, 2.1)	1.8	1.3	.71 (.61, .78)
CLASS STAB	92	-1.1 (-1.4, - 7)	.34	2.0(1.8, 2.4)	2.3	1.6	.28 (.08, .46)
C. BY WND/RD ANG							
<20. DEGREES	68	.1 (-.2, .5)	.44	1.8(1.5, 2.1)	1.8	1.2	.37 (.15, .56)
20. TO 60.	278	-.4 (-.8, -.1)	.52	1.6(1.5, 1.8)	1.7	1.1	.48 (.38, .56)
>60. DEGREES	138	.1 (-.2, .4)	.58	1.5(1.3, 1.7)	1.5	1.1	.74 (.66, .81)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B10. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	3.8	2.9	.9 (-.1, 1.9)	2.11 (1.16, 3.84)	-.24 (.287)
2. ALL PAIRED	491	1.8	1.5	.3 (.1, .5)	1.77 (1.48, 2.11)	-.12 (.087)
3. PAIRED BY STATION,						
STATION 1/14	38	1.2	.9	.3 (.0, .7)	2.15 (1.12, 4.14)	-.34 (.312)
STATION 2/13	31	.9	.8	.1 (-.2, .4)	1.81 (.87, 3.76)	-.13 (.345)
STATION 3/12	46	1.3	1.0	.3 (-.1, .7)	2.09 (1.16, 3.78)	-.22 (.284)
STATION 4/11	42	1.3	1.2	.2 (-.3, .6)	1.83 (.99, 3.41)	-.17 (.297)
STATION 5/10	51	1.9	1.6	.3 (-.2, .9)	1.32 (.75, 2.31)	-.20 (.269)
STATION 6/ 9	62	2.9	2.2	.7 (-.1, 1.6)	1.72 (1.03, 2.85)	-.18 (.244)
STATION 7/ 8	32	2.3	1.7	.6 (-.2, 1.5)	3.46 (1.69, 7.08)	-.22 (.340)
STATION 15/21	43	1.5	1.3	.2 (-.3, .7)	1.15 (.62, 2.13)	-.16 (.293)
STATION 16/22	44	1.5	1.3	.2 (-.2, .6)	2.80 (1.53, 5.12)	-.25 (.290)
STATION 17/19	57	2.2	1.9	.3 (-.4, 1.0)	1.48 (.87, 2.52)	-.12 (.255)
STATION 18/20	45	2.0	1.6	.3 (-.3, 1.0)	1.93 (1.06, 3.51)	-.13 (.287)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	304	1.9	1.6	.3 (.0, .6)	1.45 (1.15, 1.81)	-.15 (.110)
2.0 TO 4.0	175	1.7	1.3	.4 (.1, .7)	3.62 (2.69, 4.88)	-.18 (.145)
> 4.0 M/SEC	12	1.8	.7	1.1 (.5, 1.8)	9.17 (2.64,31.87)	-.67 (.555)
B. STABILITY GROUP						
CLASS UNST	269	1.4	1.0	.4 (.2, .6)	2.48 (1.95, 3.15)	-.16 (.117)
CLASS NEUT	130	2.8	2.1	.7 (.2, 1.2)	2.82 (2.00, 3.99)	-.21 (.169)
CLASS STAB	92	1.6	1.9	-.3 (-.8, .1)	.54 (.36, .82)	.14 (.201)
C. BY WND/RD ANG						
<20. DEGREES	78	1.3	1.5	-.2 (-.8, .3)	.68 (.43, 1.07)	.18 (.218)
20. TO 60.	275	1.6	1.4	.2 (.0, .4)	2.05 (1.62, 2.60)	-.09 (.116)
>60. DEGREES	138	2.5	1.6	.9 (.5, 1.3)	2.07 (1.48, 2.90)	-.25 (.164)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B10. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	.9 (-.6, 2.3)	.67	2.4(2.0, 3.0)	2.5	2.0	.55 (.31, .73)
2. ALL PAIRED	491	.3 (.1, .6)	.64	1.4(1.3, 1.5)	1.5	1.1	.60 (.54, .65)
3. PAIRED BY STATION,							
STATION 1/14	38	.3 (-.1, .7)	.66	.9(.7, 1.1)	.9	.8	.46 (.17, .68)
STATION 2/13	31	.1 (-.3, .5)	.61	.7(.5, .9)	.6	.5	.54 (.23, .75)
STATION 3/12	46	.3 (-.2, .8)	.63	1.1(.9, 1.4)	1.2	.9	.36 (.08, .59)
STATION 4/11	42	.2 (-.5, .8)	.64	1.0(.8, 1.3)	1.0	.8	.59 (.34, .76)
STATION 5/10	51	.3 (-.4, 1.1)	.65	1.3(1.1, 1.6)	1.3	1.1	.56 (.33, .72)
STATION 6/ 9	62	.7 (-.3, 1.8)	.69	2.1(1.8, 2.6)	2.2	1.7	.61 (.43, .75)
STATION 7/ 8	32	.6 (-.7, 1.9)	.66	2.1(1.7, 2.7)	2.1	1.7	.34 (-.01, .61)
STATION 15/21	43	.2 (-.2, .6)	.58	1.0(.9, 1.3)	1.0	.9	.57 (.33, .74)
STATION 16/22	44	.2 (-.4, .8)	.59	1.1(.9, 1.4)	1.1	.9	.47 (.20, .67)
STATION 17/19	57	.3 (-.5, 1.1)	.67	1.7(1.5, 2.1)	1.7	1.3	.59 (.39, .74)
STATION 18/20	45	.3 (-.4, 1.1)	.67	1.4(1.1, 1.8)	1.4	1.2	.60 (.37, .76)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	304	.3 (.1, .5)	.59	1.4(1.3, 1.6)	1.5	1.1	.65 (.58, .71)
2.0 TO 4.0	175	.4 (.0, .8)	.72	1.4(1.3, 1.6)	1.5	1.2	.48 (.36, .59)
> 4.0 M/SEC	12	1.1 (.0, 2.3)	1.00	.9(.6, 1.5)	1.4	1.1	.60 (.04, .87)
B. STABILITY GROUP							
CLASS UNST	269	.4 (.2, .6)	.63	1.1(1.0, 1.2)	1.2	.9	.44 (.34, .53)
CLASS NEUT	130	.7 (.2, 1.2)	.76	1.8(1.6, 2.0)	1.9	1.6	.71 (.61, .79)
CLASS STAB	92	-.3 (-.6, .0)	.51	1.6(1.4, 1.8)	1.6	1.1	.52 (.36, .66)
C. BY WND/RD ANG							
<20. DEGREES	78	-.2 (-.5, .0)	.32	1.6(1.4, 1.9)	1.6	1.1	.55 (.37, .69)
20. TO 60.	275	.2 (-.1, .6)	.65	1.4(1.3, 1.5)	1.4	1.1	.52 (.43, .60)
>60. DEGREES	138	.9 (.7, 1.1)	.81	1.3(1.2, 1.5)	1.6	1.2	.78 (.70, .84)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B11. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	3.8	6.6	-2.8 (-5.0, -.6)	.17 (.09, .31)	.27 (.287)
2. ALL PAIRED	506	1.8	3.9	-2.1 (-2.6, -1.7)	.14 (.12, .16)	.28 (.086)
3. PAIRED BY STATION,						
STATION 1/14	45	1.0	2.6	-1.6 (-2.4, -.7)	.11 (.06, .20)	.33 (.287)
STATION 2/13	36	.8	2.8	-1.9 (-3.0, -.9)	.06 (.03, .12)	.44 (.321)
STATION 3/12	49	1.2	3.1	-1.9 (-3.0, -.9)	.11 (.06, .19)	.31 (.275)
STATION 4/11	43	1.3	3.8	-2.5 (-3.8, -1.2)	.09 (.05, .17)	.42 (.293)
STATION 5/10	51	1.9	4.5	-2.6 (-4.2, -1.1)	.08 (.04, .13)	.31 (.269)
STATION 6/ 9	62	2.9	5.0	-2.2 (-3.9, -.4)	.17 (.10, .28)	.24 (.244)
STATION 7/ 8	32	2.3	3.6	-1.3 (-2.5, .0)	.60 (.29, 1.23)	.31 (.340)
STATION 15/21	43	1.5	4.0	-2.5 (-4.1, -1.0)	.06 (.03, .11)	.37 (.293)
STATION 16/22	43	1.5	3.5	-2.0 (-3.2, -.8)	.12 (.06, .21)	.47 (.293)
STATION 17/19	57	2.2	5.0	-2.8 (-4.5, -1.1)	.11 (.07, .19)	.32 (.255)
STATION 18/20	45	2.0	3.8	-1.8 (-3.4, -.2)	.11 (.06, .21)	.29 (.287)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	307	1.9	4.9	-3.0 (-3.7, -2.3)	.10 (.08, .13)	.35 (.110)
2.0 TO 4.0	187	1.6	2.4	-.8 (-1.2, -.5)	1.08 (.81, 1.44)	.33 (.141)
> 4.0 M/SEC	12	1.8	1.6	.2 (-.5, 1.0)	2.38 (.69, 8.27)	.33 (.555)
B. STABILITY GROUP						
CLASS UNST	283	1.3	2.9	-1.5 (-2.1, -1.0)	.06 (.05, .08)	.25 (.114)
CLASS NEUT	130	2.8	4.5	-1.7 (-2.4, -1.0)	.59 (.42, .84)	.32 (.169)
CLASS STAB	93	1.6	6.2	-4.6 (-5.7, -3.4)	.06 (.04, .09)	.62 (.199)
C. BY WND/RD ANG						
<20. DEGREES	84	1.2	6.1	-4.8 (-6.8, -2.9)	.03 (.02, .04)	.42 (.210)
20. TO 60.	284	1.6	3.2	-1.7 (-2.1, -1.3)	.31 (.24, .39)	.31 (.114)
>60. DEGREES	138	2.5	3.9	-1.4 (-2.1, -.7)	.30 (.21, .42)	.24 (.164)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B11. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	-2.8 (-5.6, -.1)	.38	6.1(5.1, 7.8)	6.7	3.8	.43 (.16, .65)
2. ALL PAIRED	506	-2.1 (-2.6, -1.7)	.28	4.5(4.2, 4.8)	4.9	2.7	.32 (.24, .40)
3. PAIRED BY STATION,							
STATION 1/14	45	-1.6 (-2.9, -.2)	.20	2.5(2.1, 3.1)	2.9	1.8	.48 (.22, .68)
STATION 2/13	36	-1.9 (-3.0, -.9)	.14	2.8(2.3, 3.7)	3.4	2.1	.35 (.03, .61)
STATION 3/12	49	-1.9 (-3.2, -.7)	.22	3.4(2.8, 4.2)	3.9	2.4	.27 (-.01, .52)
STATION 4/11	43	-2.5 (-3.8, -1.2)	.19	3.8(3.2, 4.9)	4.5	2.8	.34 (.04, .58)
STATION 5/10	51	-2.6 (-4.5, -.7)	.27	5.1(4.3, 6.4)	5.7	3.0	.26 (-.02, .50)
STATION 6/ 9	62	-2.2 (-3.9, -.4)	.48	5.9(5.0, 7.2)	6.2	3.2	.42 (.19, .60)
STATION 7/ 8	32	-1.3 (-2.9, .4)	.41	3.3(2.6, 4.4)	3.5	2.4	.13 (-.23, .46)
STATION 15/21	43	-2.5 (-4.2, -.9)	.21	4.5(3.7, 5.7)	5.1	2.8	.38 (.10, .61)
STATION 16/22	43	-2.0 (-3.6, -.3)	.16	3.7(3.0, 4.7)	4.1	2.2	.11 (-.20, .40)
STATION 17/19	57	-2.8 (-4.8, -.8)	.33	5.8(4.9, 7.1)	6.4	3.3	.30 (.04, .52)
STATION 18/20	45	-1.8 (-3.2, -.3)	.42	5.2(4.3, 6.5)	5.4	2.5	.12 (-.18, .40)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	307	-3.0 (-3.7, -2.4)	.28	5.4(5.0, 5.9)	6.2	3.6	.33 (.22, .42)
2.0 TO 4.0	187	-.8 (-1.3, -.4)	.29	1.7(1.5, 1.9)	1.9	1.2	.46 (.34, .56)
> 4.0 M/SEC	12	.2 (-.9, 1.4)	.42	.9(.6, 1.5)	.9	.7	.56 (-.02, .86)
B. STABILITY GROUP							
CLASS UNST	283	-1.5 (-2.1, -1.0)	.35	4.6(4.2, 5.0)	4.8	2.1	.27 (.16, .37)
CLASS NEUT	130	-1.7 (-2.3, -1.1)	.23	2.7(2.4, 3.1)	3.2	2.2	.58 (.46, .69)
CLASS STAB	93	-4.6 (-5.8, -3.4)	.17	5.3(4.6, 6.2)	7.0	5.0	.23 (.03, .41)
C. BY WND/RD ANG							
<20. DEGREES	84	-4.8 (-6.3, -3.4)	.19	8.4(7.3, 9.9)	9.6	5.2	.45 (.27, .61)
20. TO 60.	284	-1.7 (-2.2, -1.2)	.32	2.9(2.7, 3.2)	3.3	2.1	.22 (.10, .32)
>60. DEGREES	138	-1.4 (-2.0, -.9)	.27	2.9(2.6, 3.3)	3.2	2.2	.63 (.52, .72)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B12. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	3.8	5.0	-1.3 (-2.6, .1)	.65 (.36, 1.19)	.24 (.287)
2. ALL PAIRED	494	1.8	2.7	-.9 (-1.2, -.6)	.43 (.36, .51)	.20 (.087)
3. PAIRED BY STATION,						
STATION 1/14	41	1.1	1.5	-.4 (-.9, .1)	.44 (.24, .83)	.20 (.300)
STATION 2/13	35	.9	1.6	-.8 (-1.4, -.2)	.20 (.10, .39)	.40 (.325)
STATION 3/12	47	1.2	1.8	-.6 (-1.2, .0)	.40 (.22, .71)	.23 (.281)
STATION 4/11	42	1.3	2.3	-.9 (-1.7, -.2)	.37 (.20, .70)	.33 (.297)
STATION 5/10	50	1.9	3.2	-1.2 (-2.2, -.3)	.24 (.14, .43)	.26 (.272)
STATION 6/ 9	62	2.9	3.7	-.8 (-1.9, .4)	.53 (.32, .88)	-.19 (.244)
STATION 7/ 8	31	2.4	3.2	-.9 (-2.1, .3)	.69 (.33, 1.42)	.29 (.345)
STATION 15/21	43	1.5	2.5	-1.0 (-1.9, -.2)	.22 (.12, .41)	.28 (.293)
STATION 16/22	43	1.5	2.5	-1.0 (-1.7, -.3)	.43 (.23, .80)	.33 (.293)
STATION 17/19	56	2.2	3.7	-1.4 (-2.5, -.4)	.35 (.21, .60)	.29 (.257)
STATION 18/20	44	2.0	2.8	-.8 (-1.7, .1)	.48 (.26, .87)	.25 (.290)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	298	1.9	3.2	-1.3 (-1.7, -.9)	.34 (.27, .42)	.27 (.111)
2.0 TO 4.0	184	1.6	2.0	-.4 (-.7, -.1)	1.36 (1.02, 1.82)	.25 (.142)
> 4.0 M/SEC	12	1.8	1.2	.7 (-.1, 1.4)	2.85 (.82, 9.90)	-.33 (.555)
B. STABILITY GROUP						
CLASS UNST	272	1.4	1.8	-.5 (-.8, -.2)	.34 (.27, .43)	.15 (.117)
CLASS NEUT	130	2.8	3.6	-.8 (-1.5, -.2)	.69 (.49, .98)	.21 (.169)
CLASS STAB	92	1.6	3.9	-2.3 (-3.0, -1.6)	.19 (.13, .29)	.51 (.201)
C. BY WND/RD ANG						
<20. DEGREES	75	1.3	1.9	-.6 (-1.2, .0)	.52 (.33, .82)	.21 (.222)
20. TO 60.	281	1.6	2.5	-1.0 (-1.3, -.6)	.48 (.38, .61)	.23 (.115)
>60. DEGREES	138	2.5	3.5	-1.0 (-1.7, -.3)	.35 (.25, .48)	.18 (.164)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B12. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	45	-1.3 (-2.8, .3)	.44	3.2(2.7, 4.1)	3.4	2.4	.49 (.23, .68)
2. ALL PAIRED	494	-.9 (-1.2, -.7)	.39	2.4(2.2, 2.5)	2.5	1.6	.50 (.43, .56)
3. PAIRED BY STATION,							
STATION 1/14	41	-.4 (-.9, .1)	.46	1.2(1.0, 1.5)	1.3	.9	.52 (.26, .72)
STATION 2/13	35	-.8 (-1.3, -.3)	.29	1.5(1.2, 1.9)	1.6	1.0	.47 (.16, .69)
STATION 3/12	47	-.6 (-1.2, .0)	.32	1.8(1.5, 2.3)	1.9	1.2	.34 (.06, .57)
STATION 4/11	42	-.9 (-1.6, -.3)	.31	1.9(1.5, 2.4)	2.1	1.4	.44 (.16, .66)
STATION 5/10	50	-1.2 (-2.1, -.4)	.34	2.6(2.2, 3.3)	2.9	1.9	.47 (.22, .66)
STATION 6/ 9	62	-.8 (-1.7, .1)	.52	3.1(2.6, 3.8)	3.2	2.2	.56 (.36, .71)
STATION 7/ 8	31	-.9 (-2.4, .7)	.48	3.1(2.5, 4.1)	3.2	2.1	.16 (-.20, .49)
STATION 15/21	43	-1.0 (-1.8, -.3)	.33	1.9(1.6, 2.4)	2.2	1.5	.64 (.42, .79)
STATION 16/22	43	-1.0 (-1.8, -.1)	.33	1.8(1.5, 2.3)	2.0	1.3	.40 (.12, .63)
STATION 17/19	56	-1.4 (-2.5, -.3)	.43	3.2(2.7, 3.9)	3.5	2.2	.42 (.18, .62)
STATION 18/20	44	-.8 (-1.6, .0)	.43	2.3(1.9, 3.0)	2.4	1.6	.43 (.15, .64)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	298	-1.3 (-1.6, -1.0)	.30	2.7(2.5, 3.0)	3.0	2.0	.51 (.43, .59)
2.0 TO 4.0	184	-.4 (-.8, .0)	.49	1.5(1.4, 1.7)	1.6	1.0	.51 (.40, .61)
> 4.0 M/SEC	12	.7 (-.3, 1.6)	.92	.8(.6, 1.3)	1.0	.7	.67 (.16, .90)
B. STABILITY GROUP							
CLASS UNST	272	-.5 (-.7, -.2)	.41	1.8(1.7, 2.0)	1.9	1.2	.45 (.35, .54)
CLASS NEUT	130	-.8 (-1.3, -.3)	.45	2.3(2.1, 2.7)	2.5	1.6	.65 (.54, .74)
CLASS STAB	92	-2.3 (-2.8, -1.9)	.23	3.1(2.7, 3.7)	3.9	2.8	.11 (-.10, .31)
C. BY WND/RD ANG							
<20. DEGREES	75	-.6 (-.9, -.2)	.27	2.0(1.7, 2.4)	2.1	1.5	.43 (.22, .60)
20. TO 60.	281	-1.0 (-1.3, -.6)	.40	2.2(2.1, 2.5)	2.4	1.5	.35 (.24, .45)
>60. DEGREES	138	-1.0 (-1.5, -.5)	.43	2.8(2.5, 3.1)	2.9	1.9	.61 (.50, .71)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B13. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	2.1	2.4	-.2 (-.5, .0)	.39 (.31, .49)	-.12 (.111)
2. ALL PAIRED	521	1.6	1.8	-.2 (-.3, .0)	.48 (.41, .57)	-.10 (.084)
3. PAIRED BY STATION,						
STATION 1	144	.9	1.4	-.5 (-.6, -.3)	.82 (.59, 1.14)	.31 (.160)
STATION 2	197	2.0	1.9	.1 (-.3, .4)	.39 (.29, .51)	-.28 (.137)
STATION 3	180	1.7	1.9	.2 (-.5, .1)	.40 (.30, .54)	-.16 (.143)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	255	1.5	2.0	-.5 (-.8, -.2)	.30 (.24, .39)	.16 (.120)
2.0 TO 4.0	194	1.7	1.7	.0 (-.2, .2)	.89 (.67, 1.18)	.07 (.138)
> 4.0 M/SEC	72	1.8	1.1	.6 (.3, 1.0)	1.73 (1.08, 2.76)	-.38 (.227)
B. STABILITY GROUP						
CLASS UNST	75	1.6	1.2	.3 (.0, .7)	.93 (.58, 1.46)	-.23 (.222)
CLASS NEUT	355	1.8	2.0	-.2 (-.5, .0)	.43 (.35, .53)	-.10 (.102)
CLASS STAB	91	1.0	1.3	-.3 (-.6, -.1)	.44 (.29, .67)	.20 (.202)
C. BY WND/RD ANG						
<20. DEGREES	131	1.4	1.9	-.5 (-.9, .0)	.33 (.23, .46)	-.21 (.168)
20. TO 60.	206	1.6	1.7	-.1 (-.3, .1)	.65 (.50, .86)	-.09 (.134)
>60. DEGREES	184	1.7	1.7	.0 (-.3, .2)	.57 (.42, .76)	-.08 (.142)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B13. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	-.2 (-.5, .0)	.52	1.5(1.4, 1.6)	1.5	1.0	.55 (.46, .62)
2. ALL PAIRED	521	-.2 (-.4, .1)	.49	1.6(1.5, 1.7)	1.6	1.1	.36 (.29, .44)
3. PAIRED BY STATION,							
STATION 1	144	-.5 (-.8, -.1)	.22	1.0(.9, 1.2)	1.1	.9	.13 (-.03, .29)
STATION 2	197	.1 (-.4, .5)	.57	1.6(1.5, 1.8)	1.6	1.2	.55 (.44, .64)
STATION 3	180	-.2 (-.8, .4)	.61	2.0(1.8, 2.2)	2.0	1.3	.15 (.00, .29)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	255	-.5 (-1.0, .0)	.38	1.9(1.8, 2.1)	2.0	1.4	.36 (.24, .46)
2.0 TO 4.0	194	.0 (-.2, .2)	.52	1.2(1.1, 1.3)	1.2	.9	.52 (.41, .61)
> 4.0 M/SEC	72	.6 (.3, .9)	.81	1.2(1.0, 1.4)	1.4	.9	.41 (.19, .58)
B. STABILITY GROUP							
CLASS UNST	75	.3 (-.3, .9)	.63	1.5(1.3, 1.8)	1.5	1.1	.12 (-.11, .34)
CLASS NEUT	355	-.2 (-.5, .1)	.48	1.8(1.7, 1.9)	1.8	1.2	.38 (.29, .46)
CLASS STAB	91	-.3 (-.6, - 1)	.38	1.0(.9, 1.2)	1.1	.8	.28 (.08, .46)
C. BY WND/RD ANG							
<20. DEGREES	131	-.5 (-1.3, .4)	.45	2.4(2.2, 2.8)	2.5	1.9	.12 (-.05, .29)
20. TO 60.	206	-.1 (-.3, .1)	.50	1.1(1.0, 1.2)	1.1	.8	.62 (.52, .69)
>60. DEGREES	184	.0 (-.4, .3)	.51	1.4(1.3, 1.6)	1.4	1.0	.45 (.32, .55)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B14. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	2.1	3.6	-1.4 (-2.0, -.9)	.05 (.04, .07)	.17 (.111)
2. ALL PAIRED	549	1.5	2.9	-1.4 (-1.7, -1.0)	.09 (.07, .10)	.16 (.082)
3. PAIRED BY STATION,						
STATION 1	151	.9	2.3	-1.4 (-1.8, -.9)	.09 (.07, .13)	.39 (.157)
STATION 2	206	1.9	3.2	-1.3 (-1.9, -.8)	.09 (.07, .12)	.18 (.134)
STATION 3	192	1.6	[illegible].0	-1.4 (-2.1, -.7)	.06 (.05, .08)	.16 (.139)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	277	1.4	4.2	-2.8 (-3.4, -2.2)	.05 (.04, .06)	.36 (.116)
2.0 TO 4.0	200	1.6	1.7	-.1 (-.3, .2)	.96 (.72, 1.27)	.13 (.136)
> 4.0 M/SEC	72	1.8	1.1	.7 (.3, 1.0)	1.63 (1.02, 2.61)	-.44 (.227)
B. STABILITY GROUP						
CLASS UNST	76	1.5	2.3	-.7 (-1.5, .0)	.14 (.09, .23)	.16 (.221)
CLASS NEUT	373	1.7	3.1	-1.4 (-1.9, -1.0)	.08 (.07, .10)	.14 (.100)
CLASS STAB	100	.9	2.5	-1.6 (-2.3, -.9)	.04 (.03, .06)	.34 (.192)
C. BY WND/RD ANG						
<20. DEGREES	148	1.3	4.6	-3.3 (-4.2, -2.4)	.05 (.04, .07)	.36 (.158)
20. TO 60.	213	1.6	2.5	-.9 (-1.5, -.4)	.10 (.07, .12)	.12 (.132)
>60. DEGREES	188	1.6	1.9	-.3 (-.6, .1)	.30 (.23, .40)	-.08 (.140)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B14. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	-1.4 (-2.4, -.4)	.50	4.6(4.3, 5.0)	4.8	2.2	.30 (.20, .40)
2. ALL PAIRED	549	-1.4 (-1.9, -.8)	.42	4.0(3.8, 4.3)	4.2	2.0	.14 (.06, .22)
3. PAIRED BY STATION,							
STATION 1	151	-1.4 (-2.0, -.7)	.19	2.7(2.4, 3.0)	3.0	1.6	-.01 (-.17, .15)
STATION 2	206	-1.3 (-2.1, -.5)	.48	3.9(3.5, 4.3)	4.1	2.0	.30 (.17, .42)
STATION 3	192	-1.4 (-2.7, -.1)	.54	4.9(4.5, 5.5)	5.1	2.3	-.02 (-.17, .12)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	277	-2.8 (-3.7, -1.9)	.24	5.1(4.7, 5.6)	5.8	3.1	.17 (.05, .28)
2.0 TO 4.0	200	-.1 (-.3, .2)	.51	1.2(1.1, 1.3)	1.2	.9	.50 (.38, .59)
> 4.0 M/SEC	72	.7 (.3, 1.0)	.85	1.0(.9, 1.2)	1.2	.9	.61 (.45, .74)
B. STABILITY GROUP							
CLASS UNST	76	-.7 (-1.6, .2)	.50	3.1(2.7, 3.7)	3.2	1.6	.08 (-.15, .30)
CLASS NEUT	373	-1.4 (-2.1, -.7)	.43	4.3(4.0, 4.7)	4.5	2.1	.16 (.06, .26)
CLASS STAB	100	-1.6 (-2.4, -.8)	.33	3.3(2.9, 3.9)	3.7	2.0	-.06 (-.25, .14)
C. BY WND/RD ANG							
<20. DEGREES	148	-3.3 (-4.8, -1.8)	.20	5.6(5.0, 6.3)	6.5	3.6	.12 (-.04, .28)
20. TO 60.	213	-.9 (-1.6, -.3)	.48	3.5(3.2, 3.9)	3.6	1.6	.21 (.08, .34)
>60. DEGREES	188	-.3 (-.7, .2)	.53	2.0(1.9, 2.3)	2.1	1.3	.32 (.18, .44)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B15. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	303	2.1	6.5	-4.4 (-6.0, -2.8)	.01 (.01, .01)	.28 (.110)
2. ALL PAIRED	554	1.5	5.6	-4.1 (-5.1, -3.1)	.01 (.01, .01)	.36 (.082)
3. PAIRED BY STATION,						
STATION 1	154	.9	5.6	-4.7 (-6.5, -3.0)	.00 (.00, .01)	.60 (.155)
STATION 2	206	1.9	6.0	-4.1 (-5.7, -2.4)	.01 (.01, .01)	.29 (.134)
STATION 3	194	1.6	5.3	-3.7 (-5.6, -1.9)	.01 (.01, .01)	.29 (.138)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	278	1.4	9.1	-7.7 (-9.6, -5.7)	.00 (.00, .01)	.54 (.115)
2.0 TO 4.0	204	1.6	2.4	-.8 (-1.1, -.5)	.45 (.34, .60)	.24 (.135)
> 4.0 M/SEC	72	1.8	1.6	.2 (-.2, .7)	.76 (.47, 1.21)	-.24 (.227)
B. STABILITY GROUP						
CLASS UNST	77	1.5	3.4	-1.8 (-3.1, -.5)	.04 (.03, .06)	.31 (.219)
CLASS NEUT	377	1.7	6.0	-4.3 (-5.7, -2.9)	.01 (.01, .01)	.33 (.099)
CLASS STAB	100	.9	6.1	-5.2 (-7.1, -3.3)	.00 (.00, .01)	.56 (.192)
C. BY WND/RD ANG						
<20. DEGREES	150	1.3	9.0	-7.7 (-10.3, -5.2)	.01 (.00, .01)	.49 (.157)
20. TO 60.	217	1.6	5.3	-3.7 (-5.4, -2.0)	.01 (.01, .01)	.32 (.131)
>60. DEGREES	187	1.7	3.4	-1.7 (-2.5, -1.0)	.05 (.04, .07)	.30 (.141)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B15. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	303	-4.4 (-7.2, -1.6)	.33	13.8(12.8,15.0)	14.5	4.9	.16 (.04, .26)
2. ALL PAIRED	554	-4.1 (-5.5, -2.7)	.29	12.2(11.5,12.9)	12.8	4.6	.02 (-.06, .10)
3. PAIRED BY STATION,							
STATION 1	154	-4.7 (-7.1, -2.4)	.08	11.0(9.9,12.4)	11.9	4.9	-.09 (-.24, .07)
STATION 2	206	-4.1 (-6.6, -1.6)	.33	12.2(11.1,13.5)	12.8	4.5	.08 (-.05, .22)
STATION 3	194	-3.7 (-6.1, -1.4)	.43	13.0(11.9,14.5)	13.5	4.4	.00 (-.14, .14)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	278	-7.7 (-10.1, -5.2)	.18	16.3(15.1,17.9)	18.0	8.0	.04 (-.08, .16)
2.0 TO 4.0	204	-.8 (-1.2, -.5)	.30	1.7(1.6, 1.9)	1.9	1.3	.39 (.27, .50)
> 4.0 M/SEC	72	.2 (-.2, .6)	.71	1.3(1.1, 1.5)	1.3	.9	.54 (.35, .68)
B. STABILITY GROUP							
CLASS UNST	77	-1.8 (-3.4, -.3)	.43	5.7(4.9, 6.8)	6.0	2.5	.00 (-.22, .23)
CLASS NEUT	377	-4.3 (-6.1, -2.6)	.28	13.5(12.7,14.6)	14.2	4.8	.05 (-.05, .15)
CLASS STAB	100	-5.2 (-8.1, -2.3)	.24	9.9(8.7,11.6)	11.2	5.5	-.21 (-.39,-.01)
C. BY WND/RD ANG							
<20. DEGREES	150	-7.7 (-10.7, -4.8)	.15	15.9(14.3,17.9)	17.6	8.0	.07 (-.09, .23)
20. TO 60.	217	-3.7 (-5.7, -1.7)	.29	12.9(11.8,14.3)	13.4	4.1	.00 (-.13, .14)
>60. DEGREES	187	-1.7 (-2.8, -.7)	.42	5.2(4.7, 5.8)	5.5	2.4	.11 (-.03, .25)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B16. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	2.1	3.5	-1.3 (-1.8, -.8)	.08 (.06, .10)	.21 (.111)
2. ALL PAIRED	548	1.5	2.8	-1.3 (-1.6, -1.0)	.11 (.09, .13)	.23 (.082)
3. PAIRED BY STATION,						
STATION 1	153	.9	2.6	-1.7 (-2.3, -1.2)	.06 (.04, .08)	.49 (.155)
STATION 2	205	1.9	3.1	-1.2 (-1.7, -.6)	.10 (.08, .14)	.20 (.134)
STATION 3	190	1.6	2.7	-1.1 (-1.6, -.5)	.11 (.08, .14)	.20 (.140)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	274	1.4	3.8	-2.4 (-3.0, -1.9)	.06 (.05, .08)	.40 (.116)
2.0 TO 4.0	202	1.6	2.0	-.4 (-.6, -.1)	.81 (.62, 1.07)	.19 (.135)
> 4.0 M/SEC	72	1.8	1.3	.5 (.1, .9)	1.37 (.86, 2.20)	-.32 (.227)
B. STABILITY GROUP						
CLASS UNST	77	1.5	1.9	-.4 (-.9, .1)	.37 (.24, .59)	.16 (.219)
CLASS NEUT	373	1.7	3.1	-1.4 (-1.9, -1.0)	.09 (.08, .12)	.21 (.100)
CLASS STAB	98	.9	2.4	-1.4 (-1.9, -1.0)	.09 (.06, .14)	.43 (.194)
C. BY WND/RD ANG						
<20. DEGREES	149	1.3	3.2	-1.9 (-2.4, -1.4)	.18 (.13, .25)	.34 (.158)
20. TO 60.	212	1.6	2.4	-.8 (-1.1, -.4)	.27 (.21, .36)	.19 (.132)
>60. DEGREES	187	1.7	3.1	-1.4 (-2.1, -.7)	.05 (.04, .07)	.22 (.141)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B16. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	301	-1.3 (-1.9, -.7)	.41	3.8(3.5, 4.1)	4.0	1.9	.33 (.22, .42)
2. ALL PAIRED	548	-1.3 (-1.7, -.9)	.37	3.5(3.3, 3.7)	3.7	1.9	.21 (.13, .29)
3. PAIRED BY STATION,							
STATION 1	153	-1.7 (-2.4, -1.1)	.14	3.2(2.9, 3.6)	3.6	2.0	.09 (-.07, .25)
STATION 2	205	-1.2 (-1.8, -.5)	.41	3.5(3.2, 3.9)	3.7	1.8	.34 (.21, .46)
STATION 3	190	-1.1 (-1.9, -.3)	.49	3.6(3.3, 4.1)	3.8	1.9	.11 (-.04, .25)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	274	-2.4 (-3.2, -1.7)	.23	4.5(4.2, 4.9)	5.1	2.9	.24 (.13, .35)
2.0 TO 4.0	202	-.4 (-.6, -.1)	.41	1.2(1.1, 1.4)	1.3	.9	.51 (.40, .61)
> 4.0 M/SEC	72	.5 (.2, .8)	.78	1.0(.9, 1.2)	1.1	.8	.61 (.44, .74)
B. STABILITY GROUP							
CLASS UNST	77	-.4 (-1.1, .3)	.53	2.0(1.7, 2.4)	2.0	1.2	.17 (-.06, .38)
CLASS NEUT	373	-1.4 (-2.0, -.9)	.36	3.9(3.7, 4.2)	4.2	2.0	.23 (.13, .32)
CLASS STAB	98	-1.4 (-2.0, -.9)	.27	2.4(2.1, 2.8)	2.8	1.8	-.09 (-.28, .11)
C. BY WND/RD ANG							
<20. DEGREES	149	-1.9 (-3.0, -.9)	.24	3.0(2.7, 3.4)	3.5	2.3	.24 (.08, .38)
20. TO 60.	212	-.8 (-1.2, -.4)	.37	1.9(1.7, 2.1)	2.0	1.3	.43 (.32, .54)
>60. DEGREES	187	-1.4 (-2.4, -.4)	.46	4.9(4.5, 5.5)	5.1	2.2	.14 (.00, .28)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B17. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.8	.5	4.3 (4.2, 4.4)	33.86 (29.46,38.92)	-.98 (.068)
2. ALL PAIRED	3370	2.5	.2	2.4 (2.3, 2.4)	32.97 (30.92,35.28)	-.91 (.033)
3. PAIRED BY STATION,						
STATION 1	269	1.5	.1	1.4 (1.3, 1.5)	6.40 (5.03, 8.13)	-1.00 (.117)
STATION 2	147	1.3	.2	1.2 (1.0, 1.4)	11.49 (8.30,15.92)	-.86 (.159)
STATION 3	727	2.5	.3	2.2 (2.1, 2.3)	32.07 (27.72,37.09)	-.88 (.071)
STATION 4	780	4.4	.2	4.2 (4.0, 4.3)	23.94 (20.80,27.55)	-.96 (.069)
STATION 5	765	2.2	.1	2.1 (2.0, 2.1)	11.86 (10.29,13.67)	-.99 (.070)
STATION 6	682	1.5	.1	1.4 (1.3, 1.5)	17.77 (15.29,20.65)	-1.00 (.074)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	1508	2.7	.2	2.4 (2.3, 2.5)	44.21 (39.96,48.91)	-.85 (.050)
2.0 TO 4.0	1589	2.4	.1	2.3 (2.2, 2.4)	23.63 (21.42,26.08)	-.96 (.048)
> 4.0 M/SEC	273	2.5	.1	2.4 (2.2, 2.6)	23.47 (18.50,29.79)	-.99 (.116)
B. STABILITY GROUP						
CLASS UNST	3174	2.6	.2	2.4 (2.3, 2.5)	33.27 (31.03,35.67)	-.91 (.034)
CLASS NEUT	162	2.2	.2	2.0 (1.8, 2.3)	28.04 (20.57,38.24)	-.90 (.151)
CLASS STAB	34	1.9	.3	1.6 (1.1, 2.1)	17.71 (8.85,35.47)	-.79 (.330)
C. BY WND/RD ANG						
<20. DEGREES	2608	2.4	.1	2.3 (2.2, 2.4)	28.31 (26.22,30.57)	-.93 (.038)
20. TO 60.	542	2.8	.3	2.5 (2.3, 2.7)	41.44 (35.01,49.06)	-.86 (.083)
>60. DEGREES	220	3.0	.3	2.7 (2.3, 3.0)	51.50 (39.48,67.16)	-.83 (.130)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B17. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS				
		BIAS		CHARACTERISTIC DISCREPANCIES		
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.3 (4.1, 4.5)	1.00	1.8(1.7, 1.9)	4.7	4.3	.25 (.19, .32)
2. ALL PAIRED	3370	2.4 (2.2, 2.5)	.99	1.8(1.7, 1.8)	2.9	2.4	.27 (.24, .30)
3. PAIRED BY STATION,							
STATION 1	269	1.4 (1.3, 1.5)	1.00	.8(.7, .9)	1.6	1.4	-.12 (-.23, .00)
STATION 2	147	1.2 (.9, 1.4)	.94	1.1(1.0, 1.3)	1.6	1.2	-.22 (-.37,-.06)
STATION 3	727	2.2 (2.0, 2.4)	.98	1.8(1.7, 1.9)	2.8	2.2	.12 (.05, .19)
STATION 4	780	4.2 (3.9, 4.4)	.99	1.7(1.6, 1.8)	4.5	4.2	.20 (.13, .27)
STATION 5	765	2.1 (1.9, 2.2)	1.00	1.1(1.0, 1.1)	2.3	2.1	.29 (.23, .36)
STATION 6	682	1.4 (1.3, 1.6)	1.00	1.3(1.2, 1.4)	2.0	1.4	.25 (.18, .32)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	1508	2.4 (2.3, 2.6)	.98	2.0(1.9, 2.1)	3.1	2.5	.43 (.38, .47)
2.0 TO 4.0	1589	2.3 (2.1, 2.5)	.99	1.6(1.5, 1.6)	2.8	2.3	-.04 (-.09, .01)
> 4.0 M/SEC	273	2.4 (2.0, 2.8)	1.00	1.5(1.4, 1.7)	2.8	2.4	.14 (.02, .25)
B. STABILITY GROUP							
CLASS UNST	3174	2.4 (2.3, 2.5)	.99	1.8(1.7, 1.8)	3.0	2.4	.27 (.24, .30)
CLASS NEUT	162	2.0 (1.6, 2.5)	.97	1.6(1.5, 1.8)	2.6	2.1	.26 (.11, .40)
CLASS STAB	34	1.6 (.7, 2.5)	.97	1.3(1.1, 1.8)	2.1	1.7	.45 (.13, .68)
C. BY WND/RD ANG							
<20. DEGREES	2608	2.3 (2.2, 2.4)	.99	1.7(1.6, 1.7)	2.8	2.3	.09 (.05, .13)
20. TO 60.	542	2.5 (2.3, 2.8)	.99	1.9(1.8, 2.0)	3.1	2.5	.60 (.54, .65)
>60. DEGREES	220	2.7 (2.2, 3.1)	1.00	2.3(2.1, 2.6)	3.5	2.7	.54 (.44, .63)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B18. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.8	.6	4.2 (4.1, 4.4)	7.84 (6.82, 9.02)	-.95 (.068)
2. ALL PAIRED	3401	2.5	.3	2.2 (2.2, 2.3)	15.90 (14.87,17.01)	-.86 (.033)
3. PAIRED BY STATION,						
STATION 1	280	1.4	.1	1.3 (1.2, 1.4)	6.91 (5.46, 8.74)	-.92 (.115)
STATION 2	153	1.3	.2	1.1 (.9, 1.3)	9.36 (6.80,12.87)	-.76 (.155)
STATION 3	736	2.5	.5	2.1 (1.9, 2.2)	9.97 (8.63,11.53)	-.84 (.071)
STATION 4	784	4.4	.5	3.9 (3.8, 4.0)	7.88 (6.85, 9.06)	-.92 (.069)
STATION 5	765	2.2	.1	2.0 (2.0, 2.1)	11.86 (10.29,13.67)	-.98 (.070)
STATION 6	683	1.5	.1	1.4 (1.3, 1.5)	17.78 (15.30,20.66)	-.99 (.074)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	1534	2.6	.4	2.3 (2.1, 2.4)	11.24 (10.17,12.42)	-.77 (.049)
2.0 TO 4.0	1594	2.4	.2	2.2 (2.1, 2.3)	23.71 (21.49,26.16)	-.94 (.048)
> 4.0 M/SEC	273	2.5	.1	2.4 (2.2, 2.5)	23.47 (18.50,29.79)	-.97 (.116)
B. STABILITY GROUP						
CLASS UNST	3194	2.5	.2	2.3 (2.2, 2.4)	28.01 (26.13,30.02)	-.88 (.034)
CLASS NEUT	167	2.2	.4	1.8 (1.5, 2.1)	6.07 (4.47, 8.23)	-.80 (.149)
CLASS STAB	40	1.7	1.5	.1 (-.7, 1.0)	.47 (.25, .89)	-.20 (.304)
C. BY WND/RD ANG						
<20. DEGREES	2637	2.4	.3	2.2 (2.1, 2.2)	12.31 (11.40,13.28)	-.87 (.037)
20. TO 60.	544	2.8	.3	2.5 (2.3, 2.7)	31.56 (26.67,37.35)	-.85 (.082)
>60. DEGREES	220	3.0	.3	2.7 (2.4, 3.1)	53.01 (40.64,69.13)	-.85 (.130)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B18. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.2 (4.0, 4.5)	.99	1.9(1.8, 2.0)	4.6	4.3	.12 (.05, .18)
2. ALL PAIRED	3401	2.2 (2.1, 2.4)	.97	1.8(1.7, 1.8)	2.9	2.3	.21 (.18, .25)
3. PAIRED BY STATION,							
STATION 1	280	1.3 (1.1, 1.5)	.9(	.9(.8, 1.0)	1.6	1.4	-.30 (-.40,-.19)
STATION 2	153	1.1 (.8, 1.4)	.8.	1.2(1.1, 1.4)	1.6	1.3	-.25 (-.40,-.10)
STATION 3	736	2.1 (1.8, 2.3)	.95	1.9(1.8, 2.0)	2.8	2.2	.01 (-.06, .08)
STATION 4	784	3.9 (3.7, 4.1)	.98	1.8(1.7, 1.9)	4.3	4.0	.05 (-.02, .12)
STATION 5	765	2.0 (1.9, 2.2)	1.00	1.1(1.0, 1.1)	2.3	2.0	.09 (.02, .16)
STATION 6	683	1.4 (1.3, 1.5)	1.00	1.3(1.3, 1.4)	1.9	1.4	.12 (.05, .20)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	1534	2.3 (2.1, 2.4)	.95	2.1(2.0, 2.2)	3.1	2.4	.21 (.16, .25)
2.0 TO 4.0	1594	2.2 (2.1, 2.4)	.99	1.5(1.5, 1.6)	2.7	2.2	.26 (.22, .31)
> 4.0 M/SEC	273	2.4 (1.9, 2.8)	1.00	1.5(1.4, 1.6)	2.8	2.4	.38 (.28, .48)
B. STABILITY GROUP							
CLASS UNST	3194	2.3 (2.2, 2.4)	.98	1.8(1.7, 1.8)	2.9	2.3	.30 (.27, .34)
CLASS NEUT	167	1.8 (1.3, 2.3)	.93	1.7(1.5, 1.9)	2.5	2.0	.17 (.02, .31)
CLASS STAB	40	.1 (-1.0, 1.3)	.60	2.5(2.1, 3.3)	2.5	1.7	.07 (-.24, .38)
C. BY WND/RD ANG							
<20. DEGREES	2637	2.2 (2.0, 2.3)	.97	1.7(1.6, 1.7)	2.7	2.2	.14 (.10, .17)
20. TO 60.	544	2.5 (2.2, 2.7)	.99	1.9(1.8, 2.0)	3.1	2.5	.53 (.46, .59)
>60. DEGREES	220	2.7 (2.3, 3.1)	1.00	2.3(2.1, 2.6)	3.6	2.7	.54 (.44, .63)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B19. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.8	1.1	3.8 (3.6, 4.0)	.50 (.43, .57)	-.90 (.068)
2. ALL PAIRED	3480	2.5	.5	2.0 (1.9, 2.1)	1.35 (1.27, 1.45)	-.79 (.033)
3. PAIRED BY STATION,						
STATION 1	298	1.3	.3	1.0 (.8, 1.2)	.58 (.46, .72)	-.80 (.111)
STATION 2	192	1.1	.8	.2 (-.1, .5)	.30 (.22, .39)	-.40 (.139)
STATION 3	748	2.5	.7	1.7 (1.5, 1.9)	.78 (.68, .90)	-.75 (.070)
STATION 4	783	4.4	.6	3.7 (3.6, 3.9)	.68 (.59, .78)	-.89 (.069)
STATION 5	767	2.1	.3	1.9 (1.8, 2.0)	1.51 (1.31, 1.74)	-.92 (.069)
STATION 6	692	1.5	.2	1.3 (1.2, 1.4)	6.03 (5.20, 7.00)	-.92 (.073)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	1578	2.6	.8	1.7 (1.6, 1.9)	.87 (.79, .96)	-.66 (.048)
2.0 TO 4.0	1629	2.4	.2	2.2 (2.1, 2.2)	24.32 (22.07,26.80)	-.88 (.048)
> 4.0 M/SEC	273	2.5	.1	2.4 (2.2, 2.5)	23.47 (18.50,29.79)	-.95 (.116)
B. STABILITY GROUP						
CLASS UNST	3247	2.5	.4	2.1 (2.1, 2.2)	3.54 (3.30, 3.79)	-.81 (.034)
CLASS NEUT	185	2.0	1.1	.9 (.4, 1.4)	.33 (.25, .44)	-.52 (.141)
CLASS STAB	48	1.4	4.9	-3.5 (-5.8, -1.2)	.03 (.02, .06)	.25 (.278)
C. BY WND/RD ANG						
<20. DEGREES	2711	2.4	.5	1.9 (1.8, 2.0)	.99 (.91, 1.06)	-.79 (.037)
20. TO 60.	547	2.8	.5	2.3 (2.1, 2.4)	4.35 (3.67, 5.14)	-.78 (.082)
>60. DEGREES	222	3.0	.5	2.5 (2.2, 2.8)	13.69 (10.51,17.83)	-.79 (.129)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B19. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	3.8 (3.3, 4.2)	.96	3.2(3.0, 3.3)	4.9	4.3	.02 (-.05, .09)
2. ALL PAIRED	3480	2.0 (1.8, 2.1)	.93	2.4(2.3, 2.4)	3.1	2.3	.03 (-.01, .06)
3. PAIRED BY STATION,							
STATION 1	298	1.0 (.6, 1.4)	.90	1.6(1.5, 1.8)	1.9	1.5	-.29 (-.39,-.19)
STATION 2	192	.2 (-.6, 1.0)	.68	2.4(2.2, 2.7)	2.4	1.5	-.21 (-.34,-.07)
STATION 3	748	1.7 (1.3, 2.2)	.91	2.8(2.7, 2.9)	3.3	2.3	-.05 (-.12, .03)
STATION 4	783	3.7 (3.4, 4.0)	.96	2.7(2.6, 2.8)	4.6	4.1	.01 (-.06, .08)
STATION 5	767	1.9 (1.7, 2.0)	.97	1.4(1.3, 1.4)	2.3	2.0	.07 (.00, .14)
STATION 6	692	1.3 (1.2, 1.4)	.96	1.4(1.3, 1.5)	1.9	1.4	.08 (.00, .15)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	1578	1.7 (1.4, 2.0)	.89	3.1(3.0, 3.2)	3.5	2.5	.03 (-.02, .07)
2.0 TO 4.0	1629	2.2 (2.0, 2.3)	.96	1.6(1.5, 1.6)	2.7	2.2	-.04 (-.09, .01)
> 4.0 M/SEC	273	2.4 (1.9, 2.8)	1.00	1.5(1.4, 1.7)	2.8	2.4	.14 (.02, .26)
B. STABILITY GROUP							
CLASS UNST	3247	2.1 (2.0, 2.3)	.95	2.0(2.0, 2.1)	2.9	2.3	.07 (.03, .10)
CLASS NEUT	185	.9 (.2, 1.5)	.75	3.3(3.0, 3.7)	3.4	2.1	.10 (-.05, .24)
CLASS STAB	48	-3.5 (-5.7, -1.3)	.29	7.7(6.4, 9.7)	8.4	4.5	.16 (-.13, .42)
C. BY WND/RD ANG							
<20. DEGREES	2711	1.9 (1.7, 2.1)	.92	2.4(2.4, 2.5)	3.1	2.3	-.01 (-.05, .02)
20. TO 60.	547	2.3 (2.0, 2.5)	.96	2.0(1.9, 2.2)	3.0	2.4	.25 (.16, .32)
>60. DEGREES	222	2.5 (2.1, 2.9)	.97	2.4(2.2, 2.6)	3.4	2.5	.33 (.20, .44)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B20. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.8	.7	4.1 (4.0, 4.3)	12.04 (10.47,13.83)	-.94 (.068)
2. ALL PAIRED	3439	2.5	.3	2.2 (2.1, 2.3)	19.75 (18.47,21.12)	-.82 (.033)
3. PAIRED BY STATION,						
STATION 1	292	1.3	.1	1.2 (1.1, 1.3)	7.40 (5.88, 9.31)	-.84 (.113)
STATION 2	171	1.2	.3	.8 (.7, 1.0)	9.05 (6.69,12.23)	-.56 (.147)
STATION 3	741	2.5	.5	2.0 (1.9, 2.1)	15.30 (13.25,17.68)	-.81 (.071)
STATION 4	783	4.4	.4	3.9 (3.8, 4.1)	10.72 (9.31,12.33)	-.92 (.069)
STATION 5	766	2.1	.2	2.0 (1.9, 2.1)	11.91 (10.33,13.72)	-.95 (.069)
STATION 6	686	1.5	.1	1.4 (1.3, 1.5)	17.75 (15.28,20.62)	-.96 (.073)
4. BY METEOROLOGY						
A. WIND SPEED						
< 2.0 M/SEC	1556	2.6	.4	2.2 (2.1, 2.3)	16.16 (14.63,17.85)	-.72 (.049)
2.0 TO 4.0	1610	2.4	.2	2.2 (2.1, 2.3)	24.00 (21.77,26.47)	-.92 (.048)
> 4.0 M/SEC	273	2.5	.1	2.4 (2.2, 2.6)	23.47 (18.50,29.79)	-.99 (.116)
B. STABILITY GROUP						
CLASS UNST	3233	2.5	.3	2.2 (2.2, 2.3)	21.52 (20.09,23.06)	-.83 (.034)
CLASS NEUT	169	2.1	.4	1.8 (1.5, 2.0)	10.10 (7.45,13.68)	-.76 (.148)
CLASS STAB	37	1.8	.7	1.0 (.5, 1.6)	3.99 (2.06, 7.76)	-.46 (.316)
C. BY WND/RD ANG						
<20. DEGREES	2668	2.4	.3	2.1 (2.1, 2.2)	23.65 (21.92,25.51)	-.85 (.037)
20. TO 60.	547	2.8	.4	2.4 (2.2, 2.5)	22.39 (18.93,26.48)	-.78 (.082)
>60. DEGREES	224	2.9	.5	2.4 (2.0, 2.7)	10.59 (8.14,13.78)	-.72 (.129)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B20. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS				
		BIAS		CHARACTERISTIC DISCREPANCIES		
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	795	4.1 (3.9, 4.3)	1.00	1.8(1.7, 1.9)	4.5	4.1	.16 (.09, .22)
2. ALL PAIRED	3439	2.2 (2.1, 2.3)	.96	1.8(1.7, 1.8)	2.8	2.2	.24 (.21, .27)
3. PAIRED BY STATION,							
STATION 1	292	1.2 (1.0, 1.4)	.92	1.0(.9, 1.0)	1.5	1.3	-.43 (-.52,-.33)
STATION 2	171	.8 (.5, 1.1)	.77	1.3(1.1, 1.4)	1.5	1.1	-.37 (-.50,-.24)
STATION 3	741	2.0 (1.8, 2.2)	.93	1.8(1.7, 1.9)	2.7	2.1	.10 (.03, .17)
STATION 4	783	3.9 (3.7, 4.2)	.98	1.7(1.6, 1.8)	4.3	4.0	.15 (.08, .22)
STATION 5	766	2.0 (1.9, 2.1)	.99	1.1(1.0, 1.1)	2.2	2.0	.21 (.15, .28)
STATION 6	686	1.4 (1.3, 1.5)	.9[illegible]	1.3(1.2, 1.4)	1.9	1.4	.16 (.09, .23)
4. BY METEOROLOGY							
A. WIND SPEED							
< 2.0 M/SEC	1556	2.2 (2.0, 2.3)	.93	2.0(2.0, 2.1)	3.0	2.3	.30 (.25, .34)
2.0 TO 4.0	1610	2.2 (2.0, 2.4)	.98	1.5(1.5, 1.6)	2.7	2.2	.08 (.03, .12)
> 4.0 M/SEC	273	2.4 (1.9, 2.8)	1.00	1.5(1.4, 1.6)	2.8	2.4	.22 (.10, .33)
B. STABILITY GROUP							
CLASS UNST	3233	2.2 (2.1, 2.3)	.96	1.8(1.7, 1.8)	2.8	2.3	.24 (.21, .28)
CLASS NEUT	169	1.8 (1.3, 2.2)	.90	1.6(1.4, 1.8)	2.4	1.9	.33 (.19, .46)
CLASS STAB	37	1.0 (-.1, 2.2)	.84	1.5(1.3, 2.0)	1.8	1.5	.17 (-.16, .47)
C. BY WND/RD ANG							
<20. DEGREES	2668	2.1 (2.0, 2.3)	.96	1.7(1.6, 1.7)	2.7	2.2	.12 (.09, .16)
20. TO 60.	547	2.4 (2.1, 2.6)	.97	1.9(1.8, 2.0)	3.0	2.4	.49 (.42, .55)
>60. DEGREES	224	2.4 (2.0, 2.8)	.94	2.4(2.2, 2.6)	3.4	2.5	.31 (.19, .43)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B21. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GHLN/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	2.1	2.2	-.1 (-.6, .4)	.36 (.16, .77)	-.25 (.363)
2. ALL PAIRED	84	.9	1.0	-.1 (-.4, .3)	.66 (.43, 1.02)	-.18 (.210)
3. PAIRED BY STATION,						
STATION 1	28	.4	.7	-.3 (-.6, .1)	.32 (.15, .70)	.25 (.363)
STATION 2	28	1.3	1.2	.0 (-.7, .7)	.42 (.20, .92)	-.50 (.363)
STATION 3	28	1.2	1.1	.1 (-.5, .7)	.97 (.45, 2.10)	-.18 (.363)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B21. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GHLN/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	-.1 (-.4, .2)	.54	1.0(.8, 1.3)	1.0	.8	.54 (.21, .76)
2. ALL PAIRED	84	-.1 (-.2, .1)	.64	.7(.6, .8)	.7	.5	.80 (.71, .87)
3. PAIRED BY STATION,							
STATION 1	28	-.3 (-.5, .0)	.54	.5(.4, .7)	.6	.3	.84 (.67, .92)
STATION 2	28	.0 (-.4, .4)	.68	.7(.6, 1.0)	.7	.5	.91 (.81, .96)
STATION 3	28	.1 (-.2, .4)	.71	.8(.7, 1.1)	.8	.5	.72 (.47, .86)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B22. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS		
				DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	2.1	3.0	-.9 (-1.8, .0)	.09 (.04, .20)	.29 (.363)
2. ALL PAIRED	84	.9	1.6	-.7 (-1.2, -.2)	.23 (.15, .36)	.14 (.210)
3. PAIRED BY STATION,						
STATION 1	28	.4	1.1	-.8 (-1.4, -.1)	.08 (.04, .18)	.32 (.363)
STATION 2	28	1.3	2.1	-.8 (-1.9, .2)	.14 (.07, .31)	-.29 (.363)
STATION 3	28	1.2	1.6	-.4 (-1.2, .3)	.47 (.22, 1.01)	.32 (.363)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B22. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	-.9 (-1.7, -.1)	.46	2.2(1.7, 3.0)	2.3	1.5	.33 (-.05, .62)
2. ALL PAIRED	84	-.7 (-1.0, -.3)	.45	1.6(1.4, 1.9)	1.7	1.0	.61 (.46, .73)
3. PAIRED BY STATION,							
STATION 1	28	-.8 (-1.4, -.2)	.46	1.3(1.0, 1.8)	1.5	.8	.70 (.44, .85)
STATION 2	28	-.8 (-1.7, .0)	.57	2.1(1.6, 2.8)	2.2	1.1	.68 (.42, .84)
STATION 3	28	-.4 (-.9, .1)	.32	1.4(1.1, 1.9)	1.4	.9	.55 (.22, .77)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B23. (PART 1) COMPARISON OF OBSERVED AND PREDICTED
CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	2.1	5.4	-3.4 (-6.0, -.7)	.01 (.01, .02)	.39 (.363)
2. ALL PAIRED	84	.9	3.3	-2.4 (-3.7, -1.1)	.03 (.02, .04)	.29 (.210)
3. PAIRED BY STATION,						
STATION 1	28	.4	3.0	-2.6 (-4.7, -.6)	.01 (.00, .02)	.46 (.363)
STATION 2	28	1.3	4.0	-2.8 (-5.6, .0)	.02 (.01, .04)	-.39 (.363)
STATION 3	28	1.2	3.0	-1.8 (-3.8, .2)	.05 (.02, .10)	.25 (.363)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B23. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	-3.4 (-5.9, -.9)	.25	6.6(5.2, 9.0)	7.3	3.7	.14 (-.25, .49)
2. ALL PAIRED	84	-2.4 (-3.6, -1.2)	.46	5.6(4.8, 6.6)	6.0	2.6	.37 (.17, .54)
3. PAIRED BY STATION,							
STATION 1	28	-2.6 (-4.8, -.5)	.46	5.1(4.0, 6.9)	5.7	2.7	.46 (.10, .71)
STATION 2	28	-2.8 (-5.5, -.1)	.54	6.8(5.4, 9.2)	7.2	3.1	.42 (.05, .68)
STATION 3	28	-1.8 (-3.5, -.1)	.39	4.8(3.8, 6.5)	5.0	2.1	.37 (-.01, .65)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B24. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	2.1	3.3	-1.2 (-2.3, -.2)	.07 (.03, .15)	.29 (.363)
2. ALL PAIRED	84	.9	1.7	-.8 (-1.3, -.2)	.18 (.11, .27)	.18 (.210)
3. PAIRED BY STATION,						
STATION 1	28	.4	1.4	-1.0 (-1.9, -.2)	.05 (.02, .10)	.36 (.363)
STATION 2	28	1.3	2.1	-.8 (-2.0, .3)	.13 (.06, .27)	-.39 (.363)
STATION 3	28	1.2	1.6	-.4 (-1.3, .4)	.30 (.14, .65)	.18 (.363)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B24. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	28	-1.2 (-2.1, -.3)	.36	2.5(2.0, 3.4)	2.8	1.7	.34 (-.04, .63)
2. ALL PAIRED	84	-.8 (-1.2, -.3)	.48	1.9(1.6, 2.2)	2.0	1.0	.63 (.48, .74)
3. PAIRED BY STATION,							
STATION 1	28	-1.0 (-1.9, -.2)	.43	1.8(1.4, 2.4)	2.0	1.1	.79 (.59, .90)
STATION 2	28	-.8 (-1.8, .1)	.57	2.2(1.7, 2.9)	2.3	1.1	.73 (.49, .87)
STATION 3	28	-.4 (-1.1, .2)	.43	1.6(1.3, 2.2)	1.7	.8	.59 (.28, .79)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B25. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS		
				DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.6	.5	4.1 (3.9, 4.2)	6.51 (4.48, 9.46)	-1.00 (.182)
2. ALL PAIRED	672	1.8	.1	1.7 (1.5, 1.8)	24.27 (20.86,28.24)	-.70 (.074)
3. PAIRED BY STATION,						
STATION 1	112	.5	.1	.4 (.3, .6)	4.61 (3.17, 6.70)	-.48 (.182)
STATION 2	112	.3	.1	.2 (.1, .3)	1.48 (1.02, 2.15)	-.37 (.182)
STATION 3	112	2.3	.3	2.0 (1.8, 2.2)	11.27 (7.75,16.38)	-.92 (.182)
STATION 4	112	4.3	.2	4.1 (3.9, 4.3)	11.57 (7.96,16.82)	-.99 (.182)
STATION 5	112	2.1	.1	2.0 (1.9, 2.1)	3.65 (2.51, 5.30)	-.99 (.182)
STATION 6	112	1.3	.1	1.2 (1.1, 1.4)	3.63 (2.50, 5.28)	-.99 (.182)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B25. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.1 (3.9, 4.3)	1.00	.8(.7, .9)	4.2	4.1	.04 (-.15, .22)
2. ALL PAIRED	672	1.7 (1.3, 2.0)	.88	1.5(1.4, 1.6)	2.2	1.7	.31 (.24, .38)
3. PAIRED BY STATION,							
STATION 1	112	.4 (.1, .8)	.68	.7(.6, .8)	.8	.5	-.13 (-.30, .06)
STATION 2	112	.2 (.1, .3)	.64	.4(.3, .5)	.4	.3	.01 (-.18, .19)
STATION 3	112	2.0 (1.8, 2.2)	.97	1.1(1.0, 1.3)	2.3	2.0	-.01 (-.19, .18)
STATION 4	112	4.1 (3.9, 4.3)	1.00	1.1(1.0, 1.3)	4.2	4.1	.01 (-.18, .20)
STATION 5	112	2.0 (1.9, 2.1)	1.00	.6(.5, .7)	2.1	2.0	.29 (.11, .45)
STATION 6	112	1.2 (1.1, 1.4)	1.00	.6(.5, .7)	1.4	1.2	.27 (.09, .44)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B26. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.6	.6	4.0 (3.8, 4.2)	2.89 (1.99, 4.21)	-.99 (.182)
2. ALL PAIRED	672	1.8	.2	1.6 (1.5, 1.7)	23.32 (20.04,27.13)	-.68 (.074)
3. PAIRED BY STATION,						
STATION 1	112	.5	.1	.4 (.3, .6)	4.61 (3.17, 6.70)	-.48 (.182)
STATION 2	112	.3	.1	.2 (.1, .3)	1.48 (1.02, 2.15)	-.50 (.182)
STATION 3	112	2.3	.4	1.9 (1.7, 2.1)	5.61 (3.86, 8.15)	-.88 (.182)
STATION 4	112	4.3	.5	3.9 (3.6, 4.1)	5.86 (4.03, 8.51)	-.96 (.182)
STATION 5	112	2.1	.1	2.0 (1.9, 2.1)	3.65 (2.51, 5.30)	-.99 (.182)
STATION 6	112	1.3	.1	1.2 (1.1, 1.4)	3.63 (2.50, 5.28)	-.97 (.182)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B26. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS					
		BIAS		CHARACTERISTIC DISCREPANCIES			CORRELATION COEFFICIENT*
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.0 (3.7, 4.3)	.99	1.0(.9, 1.1)	4.1	4.0	-.08 (-.26, .11)
2. ALL PAIRED	672	1.6 (1.3, 1.9)	.89	1.5(1.4, 1.6)	2.2	1.6	.37 (.30, .43)
3. PAIRED BY STATION,							
STATION 1	112	.4 (.1, .8)	.68	.7(.6, .8)	.8	.5	-.15 (-.32, .04)
STATION 2	112	.2 (.1, .3)	.69	.4(.4, .5)	.4	.3	.05 (-.14, .23)
STATION 3	112	1.9 (1.7, 2.1)	.97	1.2(1.0, 1.4)	2.2	2.0	-.05 (-.23, .14)
STATION 4	112	3.9 (3.6, 4.2)	.99	1.2(1.1, 1.4)	4.0	3.9	-.09 (-.27, .10)
STATION 5	112	2.0 (1.8, 2.1)	1.00	.6(.5, .7)	2.1	2.0	-.04 (-.23, .14)
STATION 6	112	1.2 (1.1, 1.4)	1.00	.6(.5, .7)	1.4	1.2	.19 (.01, .36)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B27. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.6	.9	3.6 (3.3, 4.0)	.23 (.16, .34)	-.93 (.182)
2. ALL PAIRED	672	1.8	.4	1.5 (1.3, 1.6)	2.87 (2.46, 3.34)	-.63 (.074)
3. PAIRED BY STATION,						
STATION 1	112	.5	.2	.3 (.2, .5)	1.79 (1.23, 2.61)	-.37 (.182)
STATION 2	112	.3	.3	.0 (-.1, .2)	.26 (.18, .38)	-.22 (.182)
STATION 3	112	2.3	.7	1.7 (1.3, 2.0)	.46 (.32, .67)	-.87 (.182)
STATION 4	112	4.3	.6	3.7 (3.4, 4.0)	.89 (.61, 1.30)	-.91 (.182)
STATION 5	112	2.1	.3	1.8 (1.7, 2.0)	1.62 (1.12, 2.36)	-.92 (.182)
STATION 6	112	1.3	.2	1.1 (1.0, 1.3)	3.63 (2.50, 5.28)	-.91 (.182)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B27. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS						
		BIAS		CHARACTERISTIC DISCREPANCIES				
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	3.6 (3.0, 4.3)	.97	1.9(1.7, 2.2)	4.1	3.9	-.06 (-.24, .13)
2. ALL PAIRED	672	1.5 (1.2, 1.7)	.83	1.7(1.6, 1.8)	2.2	1.6	.13 (.05, .20)
3. PAIRED BY STATION,							
STATION 1	112	.3 (.0, .7)	.62	.9(.8, 1.0)	.9	.6	-.11 (-.29, .07)
STATION 2	112	.0 (-.2, .2)	.51	.8(.7, 1.0)	.8	.4	.00 (-.18, .19)
STATION 3	112	1.7 (1.2, 2.2)	.93	2.0(1.7, 2.2)	2.6	2.0	-.08 (-.26, .11)
STATION 4	112	3.7 (3.3, 4.2)	.97	1.6(1.4, 1.8)	4.0	3.9	-.02 (-.21, .17)
STATION 5	112	1.8 (1.6, 2.0)	.97	.8(.7, .9)	2.0	1.9	-.02 (-.21, .16)
STATION 6	112	1.1 (1.0, 1.3)	.97	.6(.5, .7)	1.3	1.2	.19 (.01, .37)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B28. (PART 1) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES - UNPAIRED COMPARISONS: DIFFERENCE OF AVERAGES* (CO - CP) (PPM)	VARIANCE COMPARISON* (SO**2/SP**2)	FREQUENCY DISTRIBUTION COMPARISON* (F(CO) - F(CP)) MAX (FRACTION)
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	4.6	.7	3.9 (3.7, 4.1)	3.63 (2.49, 5.27)	-.98 (.182)
2. ALL PAIRED	672	1.8	.2	1.6 (1.4, 1.7)	24.27 (20.86,28.24)	-.65 (.074)
3. PAIRED BY STATION,						
STATION 1	112	.5	.1	.4 (.3, .5)	4.61 (3.17, 6.70)	-.42 (.182)
STATION 2	112	.3	.2	.1 (.0, .2)	1.48 (1.02, 2.15)	-.28 (.182)
STATION 3	112	2.3	.5	1.9 (1.7, 2.1)	7.63 (5.25,11.08)	-.88 (.182)
STATION 4	112	4.3	.4	3.9 (3.7, 4.1)	7.25 (4.99,10.53)	-.96 (.182)
STATION 5	112	2.1	.2	1.9 (1.8, 2.0)	3.65 (2.51, 5.30)	-.97 (.182)
STATION 6	112	1.3	.1	1.2 (1.1, 1.3)	3.63 (2.50, 5.28)	-.97 (.182)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE B28. (PART 2) COMPARISON OF OBSERVED AND PREDICTED CO CONCENTRATION VALUES EVENT-BY-EVENT (PAIRED IN TIME)

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

DATA SETS	NUMBER OF EVENTS	PERFORMANCE MEASURES - PAIRED COMPARISONS				
		BIAS		CHARACTERISTIC DISCREPANCIES		
		AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
1. HIGHEST CONCENTRATION, EVENT-BY-EVENT	112	3.9 (3.7, 4.2)	1.00	.9(.8, 1.0)	4.0	3.9	.01 (-.17, .20)
2. ALL PAIRED	672	1.6 (1.3, 1.9)	.85	1.5(1.4, 1.6)	2.2	1.6	.34 (.27, .40)
3. PAIRED BY STATION,							
STATION 1	112	.4 (.0, .8)	.63	.7(.6, .8)	.8	.5	-.15 (-.33, .03)
STATION 2	112	.1 (.0, .2)	.52	.4(.4, .5)	.4	.3	.03 (-.16, .21)
STATION 3	112	1.9 (1.7, 2.1)	.97	1.1(1.0, 1.3)	2.2	1.9	.00 (-.18, .19)
STATION 4	112	3.9 (3.6, 4.1)	.99	1.2(1.0, 1.3)	4.1	3.9	-.05 (-.23, .14)
STATION 5	112	1.9 (1.8, 2.1)	1.00	.6(.5, .7)	2.0	1.9	.18 (-.01, .35)
STATION 6	112	1.2 (1.1, 1.3)	1.00	.6(.5, .7)	1.3	1.2	.17 (-.02, .34)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

APPENDIX C

STATISTICS FOR HIGHEST CONCENTRATION BY STATION

In the high by station tables, model performance statistics are presented which compare the maximum observed and predicted concentrations over all time periods at each monitoring station. Each table contains results for one model, one data base, and one averaging time. The performance measures are analogous to those in Part 2 of the Appendix B tables.

Statistical analyses in these tables compare the N pairs of observed-predicted values, where N represents the number of stations. The first two columns present the averages of the maximum observed and predicted concentration values at each station. The third column presents the average difference between observed and predicted values, with the 95 percent confidence interval in parentheses (calculated with a one-sample t test). The fourth column indicates the fraction of observed- predicted data pairs for which the observed value is greater than the predicted. The standard deviation of the residuals (differences) is presented in the fifth column, with 95 percent confidence bounds as given by a Chi-Square test. The root mean square error (square root of the average squared residual) is listed next, followed by the average absolute residual. The Pearson correlation coefficient indicates the spatial correlation of the maximum concentration values at each station. The 95 percent confidence bounds for the correlation coefficient were calculated using a Fisher z test.

TABLE C1
COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.3	2.1	.2 (0., 1.)	.71	.6(.4, 1.3)	.6	.4	.92 (.53, .99)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.0	2.0	.1 (0., 0.)	.71	.3(.2, .6)	.3	.2	.97 (.83, 1.00)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C2

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.3	11.3	-9.1 (-14., -4.)	.00	5.8(3.8, 12.8)	10.5	9.1	.28 (-.60, .85)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.0	4.0	-2.0 (-3., -1.)	.00	1.0(.7, 2.3)	2.2	2.0	.55 (-.35, .92)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C3

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM75 AVERAGING TIME: HALF HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.3	5.1	-2.8 (-4., -2.)	.00	.8(.5, 1.8)	2.9	2.8	.93 (.58, .99)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM AVERAGING TIME: HALF HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.0	4.5	-2.5 (-4., -2.)	.00	1.1(.7, 2.4)	2.7	2.5	.92 (.53, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C4

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.3	2.8	-.5 (-1., 0.)	.14	.9(.6, 2.0)	1.0	.9	.80 (.12, .97)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
7	2.0	2.6	-.5 (-1., 0.)	.14	.6(.4, 1.3)	.8	.6	.87 (.35, .98)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C5

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	6.9	6.3	.7 (-2., 3.)	.50	2.7(1.8, 5.4)	2.6	1.9	.39 (-.44, .86)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	4.6	5.1	-.5 (-1., 0.)	.25	1.1(.7, 2.3)	1.2	.8	.92 (.63, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C6

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	6.9	8.0	-1.0 (-5., 3.)	.50	4.4(2.9, 8.9)	4.2	3.7	-.08 (-.74, .66)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPB)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPB)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPB)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	4.6	4.7	-.1 (-1., 1.)	.50	.9(.6, 1.7)	.8	.6	.93 (.67, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C7

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS76 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	6.9	8.4	-1.4 (-5., 2.)	.38	3.7(2.4, 7.5)	3.7	2.8	.41 (-.42, .86)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS76 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPB)	AVERAGE PREDICTED VALUE (CP) (PPB)	AVERAGE DIFFERENCE* (CO - CP) (PPB)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPB)	ROOT MEAN SQUARE ERROR (PPB)	AVERAGE ABSOLUTE DIFFERENCE (PPB)	CORRELATION COEFFICIENT*
8	4.6	6.5	-1.8 (-2., -1.)	.00	.7(.4, 1.4)	2.0	1.8	.96 (.79, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C9

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	5.5	6.0	-.5 (-1., 0.)	.50	1.9(1.4, 2.7)	1.9	1.3	.76 (.50, .89)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	4.4	5.0	-.6 (-1., 0.)	.36	1.2(1.0, 1.8)	1.3	1.0	.84 (.66, .93)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C10

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	5.5	4.9	.7 (0., 2.)	.59	2.0(1.6, 2.9)	2.1	1.6	.68 (.36, .86)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	4.4	3.6	.8 (0., 2.)	.64	1.9(1.4, 2.7)	2.0	1.4	.61 (.26, .82)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C11

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	5.5	22.1	-16.5 (-19., -14.)	.00	5.9(4.6, 8.5)	17.5	16.5	.81 (.60, .92)

C-13

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	4.4	11.9	-7.5 (-9., -6.)	.00	2.7(2.1, 3.9)	7.9	7.5	.51 (.11, .76)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C12

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	5.5	10.6	-5.0 (-6., -4.)	.00	2.5(1.9, 3.6)	5.6	5.0	.68 (.36, .86)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE EPROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
22	4.4	7.7	-3.4 (-5., -2.)	.05	2.8(2.1, 4.0)	4.3	3.4	.62 (.27, .82)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C13

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STHS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.5	8.5	-3.0 (-10., 4.)	.00	2.7(1.4, 17.2)	3.7	3.0	1.00 (1.00, 1.00)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STHS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.2	7.6	-2.4 (-7., 3.)	.00	2.0(1.1, 12.7)	2.9	2.4	.93 (.93, .93)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C14

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.5	28.0	-22.4 (-37., -8.)	.00	5.9(3.1, 37.2)	22.9	22.4	.92 (.92, .92)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

STNS	AVEPAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.2	18.8	-13.6 (-28., 1.)	.00	5.8(3.0, 36.5)	14.4	13.6	.99 (.99, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C15

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.5	126.7	-121.1 (-165., -78.)	.00	17.5(9.1,110.2)	122.0	121.1	.99 (.99, .99)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.2	49.2	-44.0 (-60., -29.)	.00	6.2(3.2, 39.2)	44.3	44.0	1.00 (1.00, 1.00)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C16

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.5	35.3	-29.8 (-41., -19.)	.00	4.5(2.4, 28.5)	30.0	29.8	.25 (.25, .25)

C-18

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	5.2	14.6	-9.4 (-13., -6.)	.00	1.5(.8, 9.4)	9.5	9.4	.56 (.56, .56)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C17

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	10.9	1.2	9.8 (6., 14.)	1.00	3.6(2.3, 8.9)	10.3	9.8	.31 (-.67, .90)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	9.6	1.0	8.6 (6., 12.)	1.00	2.9(1.8, 7.0)	9.0	8.6	.28 (-.69, .89)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C18

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	10.9	4.6	6.4 (2., 11.)	1.00	4.6(2.9, 11.3)	7.6	6.4	.28 (-.69, .89)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	9.6	2.7	7.0 (4., 10.)	1.00	3.2(2.0, 7.7)	7.5	7.0	.20 (-.73, .87)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C19

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	10.9	19.2	-8.2 (-22., 5.)	.17	12.9(8.1, 31.8)	14.4	11.1	.05 (-.79, .83)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	9.6	13.8	-4.2 (-12., 4.)	.33	7.3(4.6, 18.0)	7.9	7.2	-.12 (-.85, .77)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C20

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	10.9	2.7	8.3 (5., 12.)	1.00	3.4(2.1, 8.3)	8.8	8.3	.46 (-.57, .93)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	9.6	2.4	7.3 (4., 10.)	1.00	2.7(1.7, 6.6)	7.7	7.3	.43 (-.58, .92)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C21

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 8 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.9	4.0	-1.1 (-3., 0.)	.00	.6(.3, 3.9)	1.2	1.1	.90 (.90, .90)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 8 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.3	3.3	-1.0 (-2., 0.)	.00	.4(.2, 2.3)	1.0	1.0	.94 (.94, .94)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C22

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.9	7.3	-4.3 (-9., 1.)	.00	2.1(1.1, 12.9)	4.6	4.3	.21 (.21, .21)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.3	6.0	-3.6 (-7., 0.)	.00	1.3(.7, 8.3)	3.8	3.6	.91 (.91, .91)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C23

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.9	25.4	-22.5 (-31., -14.)	.00	3.3(1.7, 20.6)	22.6	22.5	.76 (.76, .76)

C-25

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
S T N S	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.3	17.7	-15.4 (-34., 3.)	.00	7.3(3.8, 46.1)	16.5	15.4	-.05 (-.05, -.05)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C24

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.9	10.4	-7.4 (-11., -4.)	.00	1.3(.7, 8.4)	7.5	7.4	.56 (.56, .56)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
3	2.3	5.5	-3.2 (-7., 0.)	.00	1.5(.8, 9.1)	3.4	3.2	.32 (.32, .32)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C25

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	4.2	.7	3.5 (2., 5.)	1.00	1.5(1.0, 3.8)	3.8	3.5	.95 (.62, .99)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	3.8	.5	3.3 (2., 5.)	1.00	1.7(1.1, 4.2)	3.6	3.3	.70 (-.25, .96)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C26

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	4.2	1.8	2.4 (1., 4.)	1.00	1.3(.8, 3.3)	2.7	2.4	.74 (-.18, .97)

C-28

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS: AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS: FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES: NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES: ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES: AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	3.8	.9	2.9 (2., 4.)	1.00	1.3(.8, 3.1)	3.1	2.9	.91 (.36, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C27

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	4.2	6.6	-2.4 (-7., 2.)	.50	4.4(2.7, 10.8)	4.7	3.4	.39 (-.62, .91)

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

			PERFORMANCE MEASURES					
			BIAS		CHARACTERISTIC DISCREPANCIES			
STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	AVERAGE DIFFERENCE* (CO - CP) (PPM)	FRACTION OF POSITIVE RESIDUALS (CO > CP)	NOISE* (SD) (PPM)	ROOT MEAN SQUARE ERROR (PPM)	AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	3.8	3.3	.5 (0., 1.)	.67	.9(.6, 2.2)	.9	.8	.92 (.45, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

TABLE C28

COMPARISON OF MAXIMUM OBSERVED AND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS — AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS — FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES — NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES — ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES — AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	4.2	1.6	2.6 (1., 4.)	1.00	1.3(.8, 3.1)	2.8	2.6	.92 (.43, .99)

C-10

COMPARISON OF SECOND MAXIMUM OBSERVED AND SECOND MAXIMUM
PREDICTED CONCENTRATION VALUES, PAIRED BY STATION

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

STNS	AVERAGE OBSERVED VALUE (CO) (PPM)	AVERAGE PREDICTED VALUE (CP) (PPM)	PERFORMANCE MEASURES: BIAS — AVERAGE DIFFERENCE* (CO - CP) (PPM)	BIAS — FRACTION OF POSITIVE RESIDUALS (CO > CP)	CHARACTERISTIC DISCREPANCIES — NOISE* (SD) (PPM)	CHARACTERISTIC DISCREPANCIES — ROOT MEAN SQUARE ERROR (PPM)	CHARACTERISTIC DISCREPANCIES — AVERAGE ABSOLUTE DIFFERENCE (PPM)	CORRELATION COEFFICIENT*
6	3.8	1.2	2.6 (1., 4.)	1.00	1.4(.9, 3.4)	2.9	2.6	.89 (.27, .99)

* 95 PERCENT CONFIDENCE INTERVALS IN PARENTHESES

APPENDIX D

STATISTICS FOR HIGHEST VALUES FOR VARIOUS PAIRINGS

The high value tables present single-value residuals representing the difference between the highest observed (or predicted) value over all events and locations and the corresponding predicted (observed) value for the same event or location. Each table contains results for one model, one data base, and one averaging time. The tables contain no statistical measures, since confidence intervals cannot be assigned for single-value comparisons.

The first row presents the highest observed and highest predicted concentration values, over all events and locations. The difference between observed and predicted values is given in the third column. A positive difference indicates model underprediction.

The second row presents the maximum observed concentration, over all events and locations, and the corresponding predicted value at the same time and location. Row three presents the same observed value, but with the maximum value at any location during the same time period as the observed. Row four again presents the same maximum observed value, but matches it with the maximum predicted value for any event at the same location as the observed.

The last three rows repeat the analogous single-value residuals obtained using maximum predicted values instead of observed. Again, results are presented representing pairings in space and time, pairings in time but not space, and pairings in space but not time.

TABLE D1
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION
VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/GM75 AVERAGING TIME: HALF HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.9 (3, 2,23)	4.3 (2, 2,15)	.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.9 (3, 2,23)	3.1 (3, 2,23)	1.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.9 (3, 2,23)	3.1 (3, 2,23)	1.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.9 (3, 2,23)	3.5 (3, 2,19)	1.4
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.2 (2, 2,15)	4.3 (2, 2,15)	-1.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.2 (2, 2,15)	4.3 (2, 2,15)	-1.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.8 (2, 1,18)	4.3 (2, 2,15)	-.5

TABLE D2
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/GM75 AVERAGING TIME: HALF HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.9 (3, 2,23)	22.2 (1, 2,18)	-17.3
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.9 (3, 2,23)	4.7 (3, 2,23)	.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.9 (3, 2,23)	4.7 (3, 2,23)	.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.9 (3, 2,23)	11.6 (3, 2,18)	-6.6
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.4 (1, 2,18)	22.2 (1, 2,18)	-20.8
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.6 (2, 2,18)	22.2 (1, 2,18)	-18.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	1.4 (1, 2,18)	22.2 (1, 2,18)	-20.8

TABLE D3
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/GM75 AVERAGING TIME: HALF HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.9 (3, 2,23)	8.2 (3, 2,24)	-3.3
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.9 (3, 2,23)	7.8 (3, 2,23)	-2.9
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.9 (3, 2,23)	7.8 (3, 2,23)	-2.9
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.9 (3, 2,23)	8.2 (3, 2,24)	-3.3
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.6 (3, 2,24)	8.2 (3, 2,24)	-4.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.6 (3, 2,24)	8.2 (3, 2,24)	-4.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	4.9 (3, 2,23)	8.2 (3, 2,24)	-3.3

TABLE D4
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/GM75 AVERAGING TIME: HALF HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.9 (3, 2,23)	4.6 (2, 2,18)	.3
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.9 (3, 2,23)	3.4 (3, 2,23)	1.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.9 (3, 2,23)	3.4 (3, 2,23)	1.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.9 (3, 2,23)	3.7 (3, 2,24)	1.2
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.6 (2, 2,18)	4.6 (2, 2,18)	-1.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.6 (2, 2,18)	4.6 (2, 2,18)	-1.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.8 (2, 1,18)	4.6 (2, 2,18)	-.8

TABLE D5
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION
VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS76 AVERAGING TIME: 1 HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	10.4 (5, 1, 1)	11.1 (5, 1,18)	-.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	10.4 (5, 1, 1)	10.6 (5, 1, 1)	-.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	10.4 (5, 1, 1)	10.6 (5, 1, 1)	-.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	10.4 (5, 1, 1)	11.1 (5, 1,18)	-.7
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	8.6 (5, 1,18)	11.1 (5, 1,18)	-2.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	8.6 (5, 1,18)	11.1 (5, 1,18)	-2.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	10.4 (5, 1, 1)	11.1 (5, 1,18)	-.7

TABLE D6
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS76 AVERAGING TIME: 1 HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	10.4 (5, 1, 1)	11.8 (8, 1,18)	-1.4
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	10.4 (5, 1, 1)	9.9 (5, 1, 1)	.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	10.4 (5, 1, 1)	9.9 (5, 1, 1)	.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	10.4 (5, 1, 1)	9.9 (5, 1, 1)	.5
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	5.9 (8, 1,18)	11.8 (8, 1,18)	-5.9
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	8.6 (5, 1,18)	11.8 (8, 1,18)	-3.2
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	5.9 (8, 1,18)	11.8 (8, 1,18)	-5.9

TABLE D7
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS76 AVERAGING TIME: 1 HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	10.4 (5, 1, 1)	16.5 (4, 1,12)	-6.1
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	10.4 (5, 1, 1)	11.8 (5, 1, 1)	-1.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	10.4 (5, 1, 1)	11.8 (5, 1, 1)	-1.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	10.4 (5, 1, 1)	11.8 (5, 1, 1)	-1.4
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	8.0 (4, 1,12)	16.5 (4, 1,12)	-8.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	8.0 (4, 1,12)	16.5 (4, 1,12)	-8.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	8.0 (4, 1,12)	16.5 (4, 1,12)	-8.5

TABLE D8
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS76 AVERAGING TIME: 1 HOUR

SF6 CONCENTRATIONS (PPB)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	10.4 (5, 1, 1)	13.9 (5, 1,18)	-3.5
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	10.4 (5, 1, 1)	11.2 (5, 1, 1)	-.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	10.4 (5, 1, 1)	11.2 (5, 1, 1)	-.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	10.4 (5, 1, 1)	13.9 (5, 1,18)	-3.5
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	8.6 (5, 1,18)	13.9 (5, 1,18)	-5.3
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	8.6 (5, 1,18)	13.9 (5, 1,18)	-5.3
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	10.4 (5, 1, 1)	13.9 (5, 1,18)	-3.5

TABLE D9
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/SRI75 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	11.0 (9, 2,11)	12.3 (6, 1, 9)	-1.2
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	11.0 (9, 2,11)	8.7 (9, 2,11)	2.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	11.0 (9, 2,11)	8.7 (9, 2,11)	2.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	11.0 (9, 2,11)	8.7 (9, 2,11)	2.3
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	9.0 (6, 1, 9)	12.3 (6, 1, 9)	-3.3
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	9.0 (6, 1, 9)	12.3 (6, 1, 9)	-3.3
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	10.2 (6, 1,16)	12.3 (6, 1, 9)	-2.0

TABLE D10
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/SRI75 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	11.0 (9, 2,11)	10.5 (6, 1, 8)	.5
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	11.0 (9, 2,11)	6.1 (9, 2,11)	5.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	11.0 (9, 2,11)	6.1 (9, 2,11)	5.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	11.0 (9, 2,11)	6.1 (9, 2,11)	5.0
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	5.5 (6, 1, 8)	10.5 (6, 1, 8)	-5.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	5.5 (6, 1, 8)	10.5 (6, 1, 8)	-5.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	10.2 (6, 1,16)	10.5 (6, 1, 8)	-.3

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TABLE D11
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/SRI75 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	11.0 (9, 2,11)	37.7 (9, 1,10)	-26.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	11.0 (9, 2,11)	8.8 (9, 2,11)	2.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	11.0 (9, 2,11)	8.8 (9, 2,11)	2.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	11.0 (9, 2,11)	37.7 (9, 1,10)	-26.7
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.9 (9, 1,10)	37.7 (9, 1,10)	-33.8
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	8.9 (6, 1,10)	37.7 (9, 1,10)	-28.8
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	11.0 (9, 2,11)	37.7 (9, 1,10)	-26.7

TABLE D12
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/SRI75 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	11.0 (9, 2,11)	17.2 (6, 1, 9)	-6.1
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	11.0 (9, 2,11)	8.9 (9, 2,11)	2.1
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	11.0 (9, 2,11)	8.9 (9, 2,11)	2.1
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	11.0 (9, 2,11)	12.6 (9, 1, 6)	-1.6
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	9.0 (6, 1, 9)	17.2 (6, 1, 9)	-8.2
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	9.0 (6, 1, 9)	17.2 (6, 1, 9)	-8.2
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	10.2 (6, 1,16)	17.2 (6, 1, 9)	-7.0

TABLE D13
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	6.8 (3, 3, 9)	12.3 (3, 9,21)	-5.5
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	6.8 (3, 3, 9)	2.8 (3, 3, 9)	4.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	6.8 (3, 3, 9)	2.8 (3, 3, 9)	4.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	6.8 (3, 3, 9)	12.3 (3, 9,21)	-5.5
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.3 (3, 9,21)	12.3 (3, 9,21)	-9.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.3 (3, 9,21)	12.3 (3, 9,21)	-9.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	6.8 (3, 3, 9)	12.3 (3, 9,21)	-5.5

TABLE D14
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	6.8 (3, 3, 9)	33.2 (2, 12,21)	-26.4
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	6.8 (3, 3, 9)	2.7 (3, 3, 9)	4.1
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	6.8 (3, 3, 9)	2.7 (3, 3, 9)	4.1
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	6.8 (3, 3, 9)	31.2 (3, 12,20)	-24.4
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.6 (2, 12,21)	33.2 (2, 12,21)	-31.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	2.2 (3, 12,21)	33.2 (2, 12,21)	-31.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	6.0 (2, 3, 3)	33.2 (2, 12,21)	-27.2

TABLE D15
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	6.8 (3, 3, 9)	144.0 (3, 12,20)	-137.2
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	6.8 (3, 3, 9)	3.2 (3, 3, 9)	3.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	6.8 (3, 3, 9)	3.2 (3, 3, 9)	3.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	6.8 (3, 3, 9)	144.0 (3, 12,20)	-137.2
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.1 (3, 12,20)	144.0 (3, 12,20)	-140.9
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.1 (3, 12,20)	144.0 (3, 12,20)	-140.9
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	6.8 (3, 3, 9)	144.0 (3, 12,20)	-137.2

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TABLE D16
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	6.8 (3, 3, 9)	40.7 (2, 7, 4)	-33.9
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	6.8 (3, 3, 9)	3.1 (3, 3, 9)	3.7
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	6.8 (3, 3, 9)	3.1 (3, 3, 9)	3.7
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	6.8 (3, 3, 9)	32.6 (3, 9,21)	-25.8
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	2.1 (2, 7, 4)	40.7 (2, 7, 4)	-38.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	2.1 (2, 7, 4)	40.7 (2, 7, 4)	-38.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	6.0 (2, 3, 3)	40.7 (2, 7, 4)	-34.7

TABLE D17
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GHLN/CAL74 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	15.6 (6, 8,23)	2.3 (4, 2, 5)	13.3
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	15.6 (6, 8,23)	.2 (6, 8,23)	15.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	15.6 (6, 8,23)	.8 (4, 8,23)	14.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	15.6 (6, 8,23)	.6 (6, 2, 5)	15.0
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.7 (4, 2, 5)	2.3 (4, 2, 5)	1.4
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.7 (4, 2, 5)	2.3 (4, 2, 5)	1.4
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	11.6 (4, 7, 5)	2.3 (4, 2, 5)	9.3

TABLE D18
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	15.6 (6, 8,23)	10.7 (4, 3,12)	4.9
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	15.6 (6, 8,23)	.1 (6, 8,23)	15.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	15.6 (6, 8,23)	.8 (4, 8,23)	14.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	15.6 (6, 8,23)	1.8 (6, 3,12)	13.8
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.0 (4, 3,12)	10.7 (4, 3,12)	-7.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.0 (4, 3,12)	10.7 (4, 3,12)	-7.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	11.6 (4, 7, 5)	10.7 (4, 3,12)	.9

TABLE D19
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	15.6 (6, 8,23)	41.7 (4, 3,12)	-26.1
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	15.6 (6, 8,23)	.3 (6, 8,23)	15.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	15.6 (6, 8,23)	.6 (4, 8,23)	15.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	15.6 (6, 8,23)	6.8 (6, 2,12)	8.8
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.0 (4, 3,12)	41.7 (4, 3,12)	-38.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.0 (4, 3,12)	41.7 (4, 3,12)	-38.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	11.6 (4, 7, 5)	41.7 (4, 3,12)	-30.1

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TABLE D20
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 1 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	15.6 (6, 8,23)	5.0 (4, 2, 4)	10.6
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	15.6 (6, 8,23)	.3 (6, 8,23)	15.3
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	15.6 (6, 8,23)	.8 (4, 8,23)	14.8
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	15.6 (6, 8,23)	2.1 (6, 2, 4)	13.5
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	2.4 (4, 2, 4)	5.0 (4, 2, 4)	-2.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	2.4 (4, 2, 4)	5.0 (4, 2, 4)	-2.6
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	11.6 (4, 7, 5)	5.0 (4, 2, 4)	6.6

TABLE D21
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/NYS77 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.2 (3, 1, 6)	5.0 (2, 1, 7)	-.8
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.2 (3, 1, 6)	2.6 (3, 1, 6)	1.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.2 (3, 1, 6)	2.6 (3, 1, 6)	1.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.2 (3, 1, 6)	4.6 (3, 1,21)	-.5
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	3.3 (2, 1, 7)	5.0 (2, 1, 7)	-1.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.3 (2, 1, 7)	5.0 (2, 1, 7)	-1.7
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.3 (2, 1, 7)	5.0 (2, 1, 7)	-1.7

TABLE D22
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION
VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/NYS77 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.2 (3, 1, 6)	9.3 (2, 1,15)	-5.2
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.2 (3, 1, 6)	2.6 (3, 1, 6)	1.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.2 (3, 1, 6)	2.6 (3, 1, 6)	1.6
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.2 (3, 1, 6)	6.2 (3, 2, 3)	-2.1
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.9 (2, 1,15)	9.3 (2, 1,15)	-7.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	1.9 (2, 1,15)	9.3 (2, 1,15)	-7.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.3 (2, 1, 7)	9.3 (2, 1,15)	-6.1

TABLE D23
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/NYS77 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.2 (3, 1, 6)	29.3 (2, 2, 3)	-25.1
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.2 (3, 1, 6)	3.2 (3, 1, 6)	1.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.2 (3, 1, 6)	3.2 (3, 1, 6)	1.0
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.2 (3, 1, 6)	26.1 (3, 2, 3)	-21.9
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.4 (2, 2, 3)	29.3 (2, 2, 3)	-27.9
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	2.2 (3, 2, 3)	29.3 (2, 2, 3)	-27.1
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.3 (2, 1, 7)	29.3 (2, 2, 3)	-26.0

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TABLE D24
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION
VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/NYS77 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	4.2 (3, 1, 6)	11.9 (2, 1,15)	-7.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	4.2 (3, 1, 6)	2.7 (3, 1, 6)	1.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	4.2 (3, 1, 6)	2.7 (3, 1, 6)	1.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	4.2 (3, 1, 6)	10.1 (3, 1,21)	-6.0
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.9 (2, 1,15)	11.9 (2, 1,15)	-10.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	1.9 (2, 1,15)	11.9 (2, 1,15)	-10.0
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	3.3 (2, 1, 7)	11.9 (2, 1,15)	-8.6

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TABLE D25
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: GMLN/CAL74 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	7.4 (4, 1,21)	1.5 (4, 1, 4)	5.9
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	7.4 (4, 1,21)	.7 (4, 1,21)	6.7
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	7.4 (4, 1,21)	.7 (4, 1,21)	6.7
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	7.4 (4, 1,21)	1.5 (4, 1, 4)	5.9
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.8 (4, 1, 4)	1.5 (4, 1, 4)	.4
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	4.0 (3, 1, 4)	1.5 (4, 1, 4)	2.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	7.4 (4, 1,21)	1.5 (4, 1, 4)	5.9

TABLE D26
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: CAL3/CAL74 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	7.4 (4, 1,21)	4.2 (3, 1, 8)	3.2
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	7.4 (4, 1,21)	1.2 (4, 1,21)	6.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	7.4 (4, 1,21)	1.2 (4, 1,21)	6.2
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	7.4 (4, 1,21)	3.2 (4, 1, 8)	4.3
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	.9 (3, 1, 8)	4.2 (3, 1, 8)	-3.3
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.7 (4, 1, 8)	4.2 (3, 1, 8)	-.5
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	5.6 (3, 1,17)	4.2 (3, 1, 8)	1.4

TABLE D27
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: PAL/CAL74 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	7.4 (4, 1,21)	15.1 (3, 1, 8)	-7.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	7.4 (4, 1,21)	4.0 (4, 1,21)	3.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	7.4 (4, 1,21)	4.0 (4, 1,21)	3.4
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	7.4 (4, 1,21)	7.2 (4, 1, 9)	.2
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	.9 (3, 1, 8)	15.1 (3, 1, 8)	-14.2
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	3.7 (4, 1, 8)	15.1 (3, 1, 8)	-11.4
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	5.6 (3, 1,17)	15.1 (3, 1, 8)	-9.5

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TABLE D28
COMPARISONS OF HIGHEST OBSERVED AND PREDICTED CONCENTRATION VALUES FOR DIFFERENT TIME AND SPACE PAIRINGS

SES STATISTICS FOR MODEL/DATA BASE: HWY2/CAL74 AVERAGING TIME: 8 HOUR

CO CONCENTRATIONS (PPM)
(STATION,DAY,HOUR)

	OBSERVED	PREDICTED	DIFFERENCE
MAX OBS AND MAX PRED	7.4 (4, 1,21)	2.7 (4, 1, 4)	4.7
MAX OBS AND PRED VALUE FOR SAME EVENT AND LOCATION AS MAX OBS	7.4 (4, 1,21)	1.9 (4, 1,21)	5.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME EVENT AS MAX OBS (ANY LOCATION)	7.4 (4, 1,21)	1.9 (4, 1,21)	5.5
MAX OBS AND HIGHEST PRED VALUE FOR SAME LOCATION AS MAX OBS (ANY EVENT)	7.4 (4, 1,21)	2.7 (4, 1, 4)	4.7
MAX PRED AND OBS VALUE FOR SAME EVENT AND LOCATION AS MAX PRED	1.8 (4, 1, 4)	2.7 (4, 1, 4)	-.9
MAX PRED AND HIGHEST OBS VALUE FOR SAME EVENT AS MAX PRED (ANY LOCATION)	4.0 (3, 1, 4)	2.7 (4, 1, 4)	1.2
MAX PRED AND HIGHEST OBS VALUE FOR SAME LOCATION AS MAX PRED (ANY EVENT)	7.4 (4, 1,21)	2.7 (4, 1, 4)	4.7

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-450/4-86-002		

4. TITLE AND SUBTITLE	5. REPORT DATE
Evaluation of Mobile Source Air Quality Simulation Models	February 1986
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
David Wackter and Paul Bodner	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
TRC Environmental Consultants, Inc. 800 Connecticut Boulevard East Hartford, Connecticut 06108	11. CONTRACT/GRANT NO. 68-02-3886

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
U.S. EPA OAQPS, MDAD, SRAB (MD-14) Research Triangle Park, NC 27711	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report summarizes the result of a comprehensive evaluation of four mobile source air quality simulation models using data collected from five field measurement programs. The report contains numerous tabulations of each model's performance in terms of statistical measures of performance recommended by the American Meteorological Society.

The purpose of the report is two-fold. First, it serves to document for the models considered, and similar models, their relative performance. Second, it provides the basis for a peer scientific review of the models. To stay within the spirit of this latter purpose, the report is limited to a factual presentation of information and performance statistics. No attempt is made to interpret the statistics or to provide direction to the reader, lest reviewers might be biased.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Mobile Source Air Quality Models Carbon Monoxide Statistical Measures Performance Evaluation Mobile Source Data Sets		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
		236
	20. SECURITY CLASS *(This page)*	22. PRICE

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